

# portable

## 100/200

FOR USERS OF TANDY BRIEFCASE COMPUTERS



## *TANDY PORTABLE DISK DRIVE ENTER THE SECOND TIME AROUND*

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Morse Code on your 100

### WHERE PROGRAMS HIDE

Machine Language Storage Explained

### INTERACTIVE SOLUTIONS

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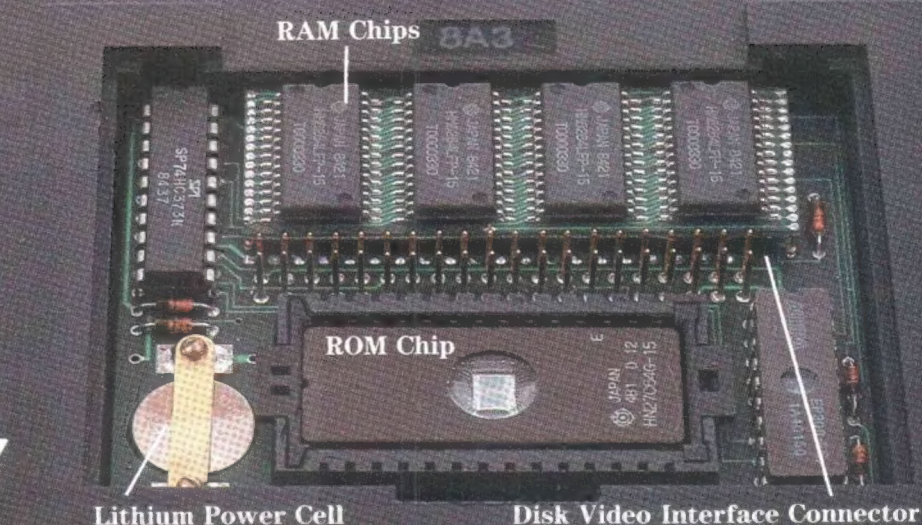
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SAN LUIS OBISPO CA 93406

COMING NEXT MONTH:  
Tandy 600 Review

# State of The Art RAM Technology

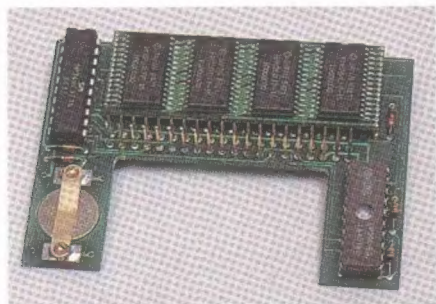


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**"The new PG Design RAM should be in every Model 100 built!"**

## Miniaturized Technology

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We stand behind all the products we manufacture at **PG Design**. If you are not completely satisfied with your purchase, call us! If we cannot solve your problem, return the product to us and we will refund your money. We are positive that you will be completely satisfied with all our products.

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Data Transfer Program — call

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# portable

## 100/200

NOVEMBER 1985

VOLUME THREE, NUMBER THREE



### ON THE COVER

#### TANDY ENTERS THE FRAY .....34

The portable disk drive market heats up with the latest from Fort Worth. A good dependable machine, it's not going to lead the pack but it'll keep competitors looking over their shoulders.

*By Park M. Morrison*

*Cover Photo by Benjamin Magro*

### ARTICLES

#### THAT COMPOUNDING INTEREST.....11

Calculate future values with your Model 100.

#### A SUPER INPUT ROUTINE .....17

How to customize screen input.

*By Rick Rothstein*

#### HELLO RANGOON .....32

Use a portable to communicate in Morse code.

*By Louis C. Graue*

#### CONSERVING PRECIOUS MEMORY.....44

Machine-language storage explained.

*By Jim Irwin*

#### FINDING A NEEDLE IN A HAYSTACK.....62

A program to search many files automatically.

*By Leo S. Reich*

#### TANDY'S ROM.....70

Introducing a three-in-one ROM package of their own.

*By Carl Oppedahl*

### REVIEWS

#### WHAT YOU SEE AND WHAT YOU GET.....27

*By J. R. Wilson*

#### A FRIEND INDEED.....28

*By J. R. Wilson*

#### ORDER OF SORTS .....52

*By Carl Oppedahl*

### DEPARTMENTS

#### ROM WITH A VIEW .....5

#### GIGO.....7

#### TELCOM.....8

#### NEW PRODUCTS .....23

#### WIRE .....41

#### AD INDEX .....69



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- Host Mode for remote control of desktop computer from Model 100, Tandy 200, dumb terminal, or any computer with Telcom capability.

You don't have to put extra code on your Model 100 or Tandy 200 to transfer files — **no cassettes, no ROM cartridges.** Telecommuter will exchange files with any computer that has an RS-232 port and communications software, even another desktop computer.

Optional advanced features include XMODEM protocol file transfer, full VT100 terminal emulation, Telcom scripts and macros for automatic dialup and file transfer, DOS access from editor, and multiple access level Host Mode. **TC-Corporate** allows individual user assignments, such as password, access level and time limit; keeps activity log.

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**TC-standard** or **TC-XMODEM** \$200, **TC-DeLuxe** \$300, **TC-plus** \$400, and **TC-Corporate** \$1000.

Look for Telecommuter at your local Radio Shack Computer Store!

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ISSN 0738-7016

## ROM WITH A VIEW

# TANDY'S COMMITMENT TO LAPTOP COMPUTING

**A** rule of thumb in the consumer electronics industry is that the clock starts ticking when you introduce a new product. You have 12 months to replace the new device with a more powerful, cost-effective unit.

You have even less time if the product is a microcomputer. Look at Apple, for instance, with its original Apple II replaced in succession by the II Plus, the Apple III, the Apple IIe and the Apple IIc.

You have less time still if you're building portable computers. Technology is advancing much faster than consumer demand, so you need to start designing a follow-up product or two even before you release your first brainchild. Gavilan Computer learned that lesson the hard way — the company kept changing its Mobile Computer to keep up with the latest technological breakthroughs. The result: Gavilan entered a perpetual redesign cycle and wound up never shipping any units out the door. Needless to say, the company went broke.

It was almost three years ago that Tandy Corp.'s Radio Shack division introduced the TRS-80 Model 100. It wasn't revolutionary, but just a logical successor to the Epson HX-20 as the low-end leader in the laptop computer market.

Logic tells us the 100 should have sold well for nine to 12 months, then been gradually phased out as consumers voted with their checkbooks for more advanced computers from Tandy or other vendors.

No one could have foreseen that the Model 100 would continue to sell briskly almost three years later, in the last days of 1985.

The credit is due to users and a small band of entrepreneurial software and add-on suppliers who have extended the Model 100's power far beyond anything Tandy could have predicted. Innovative, powerful products have led the 100 into markets and applications closed to computers many times larger and more powerful.

Now Tandy is joining the crowd, introducing its most significant Model 100 add-ons since the ill-received Disk/Video Interface. The company's \$200 Portable Disk Drive gives users a convenient, affordable alternative to unwieldy audiocassette storage. And Interactive Solutions, Tandy's first foray into the option ROM arena, is going to give Portable Computer Support Group and Traveling Software a run for their money in the multi-program ROM derby.

Tandy watchers, take note. These products are more important than their price points and performance specs. They represent convincing evidence to support Tandy's contention that it is committed to the laptop market in general, and to the 100 in particular.

At a time when most manufacturers would be phasing out a product, Tandy is seeking to breathe new life into the market. Those of us who've spent the past two and a half years working to extend the 100's usefulness can only welcome this move.

In support of Tandy's drive, Portable 100/200 will publish the bare bones of a full-function operating system in the January or February 1986 issue. The present operating system, now supplied with the drive, has weaknesses that limit the drive's usefulness. (See our review in this issue.) Our goal is to remove these limitations through publication and distribution of public domain software. It's the least we could do.

The Model 100 isn't the whole story, of course. We'll also develop a version of the operating system that will run on the Tandy 200.

We won't need to adapt the operating system for Radio Shack's newest portable, the Tandy 600. That product, introduced October 28, includes a 360K internal disk drive as standard equipment, along with a 300 bits per second (bps) modem, Microsoft software and a 16-line, 80-character screen. Contrary to most advance rumors, the \$1,599 unit *doesn't* run MS-DOS. But you can read all the pertinent details in our review next month.

The Tandy 600 isn't an isolated phenomenon. Coupled with Tandy's ongoing support for the Model 100 and Tandy 200, it represents a substantial commitment to laptop computing. Tandy is the only company that's really analyzed what people do with portable computers before introducing products.

# TMPC

## A Plan for Efficiency



For the TRS-80 Model 100

### More than a Calendar

TMPC helps you organize your day. It is more than a calendar program; it is a toolbox to help you keep your most urgent tasks at top priority.

### Efficiency is no Game

When you use TMPC, you enter the system of screens and corridors shown above and access features by moving through the rooms with the arrow keys. The screens may resemble an adventure game, but TMPC is a serious tool. The user interface will become second nature to you, like walking through the rooms in your home.

### Functions for Efficiency

Each screen has its own function. For example, one

screen includes a perpetual calendar, and another shows a "warehouse" of tasks to be done. In other screens you can set entries that repeat weekly, monthly, quarterly or yearly; request a warning of up to 999 days for any entry; sort your to-do list by stress level and priority; and more.

### Organization Philosophy

TMPC has more than just "features;" it has a *philosophy* of time management inspired by Stephanie Winston's best seller, *The Organized Executive*. You won't learn all there is to know about TMPC in five minutes, but after using it, you'll feel more *organized*, not just more computerized.

### Spreading the Word

One user told us that he felt *guilty* to get so much functionality at so low a price. Find out for yourself. Order TMPC today.

### TMPC by Ac' rō'ā'tix

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# BATTERY LIFE — IRRELEVANT?

**Y**our reviews of the Portable Computer Support Group's (PCSG) 64K module contain misconceptions that, as designers and manufacturers of the module, we want to correct.

The PCSG module's nickel cadmium batteries are designed to automatically recharge just like the nickel cadmium battery in the Model 100 itself. There are no replacement instructions for the module's battery, any more than there are instructions to desolder the Model 100's internal battery in its operation manual. The rechargeable battery in our module, as the battery in the computer, was not designed as an item requiring replacement. Comparisons concerning battery life are irrelevant; once the computer is turned on, the battery recharges. The design goal was to retain memory for longer than the computer does and that goal was met.

Gary H. Kakert  
Vice President  
Cryptonics, Inc.

*Battery life is normally irrelevant. However, if the computer is powered down for a period of weeks or months data loss may result. Cassette or disk backup is recommended if a computer won't be used for an extended period.*

— Ed.

## CANADIAN USER GROUP FORMING

A model 100 user group is being set up in Edmonton. For more information write Erik Ellehoj, Department of Geography, University of Alberta, Edmonton, Canada T6H-2H4.

## MORE ON OUR ADVERTISING BROUHAHA

In our August issue, we ran an editorial on the advertising practices of this magazine and those of some of our advertisers. Quite simply, it raised some hackles. In an effort to assuage those readers who think we're bordering on the criminal by running advertisements for products before they're available, we offer the following:

First, we do not knowingly run ads for companies that do not have and do not

intend to have a product. We do and will continue, however, to act in good faith as we expect our advertisers to do. We won't tell them how to run their business and don't expect them to tell us how to run ours.

Second, we are not and do not claim to be a watchdog agency. We'll leave that up to organizations such as the Better Business Bureau. We would suggest therefore, if you are going to buy a product from a company with whom you are unfamiliar, especially through the mail, check them out first.

Lastly, we encourage our readers to write and tell us of companies with whom they've encountered problems. By that we mean either lack of communication or an obvious runaround. We will

publish any pertinent letters in this column with responses from the advertiser. — Ed.

I read with interest your August editorial. As a disappointed attempted purchaser of several items from vendors, I find your action reprehensible and will from this point on presume all your advertisers to be liars by virtue of having sought publication by a publisher who totally lacks ethics.

This is an affront to your vendors who value their reputations and take pains to provide what they promise.

Raising capital for business projects on the open market is a practice governed by law in this country and as such  
(continued on page 42)



# WHERE DO WE GO FROM HERE?

A new way to go to CompuServe's Model 100 Special Interest Group (SIG): *go m100sig*. Isn't that an improvement over the cryptic *go pcs-154*? That referred to Personal Computing Service Number 154, by the way.

CompuServe is cleaning up its act for many of its on-line services. Electronic mail can be accessed by typing *go easy* at any exclamation-mark prompt (!). Most other SIGs have the new, simplified addresses. Currently, the old section-page system still works, but there's no guarantee on how long CompuServe will recognize *go pcs-21* in place of *go trs80pro* for the TRS-80 Professional Forum.

This new system makes browsing through CompuServe's vast number of service easier — and faster. Before, finding a service frequently required a stop at the on-line index (*go index*) — now, a guess is often as good as a name.

Why browse through CompuServe? True, the Model 100 SIG and EasyPlex electronic mail are all many readers need. But there are scores of exciting services, games and SIGs available — 332 at last count.

## COMPUTING POWER

Computer-specific SIGs abound. CO-CO is the address of the forum for TRS-80 Color Computer owners, and IBM-NOVICE and IBMSIG support owners of the venerable IBM PC and close compatibles. And the Kaypro user's forum can be reached by typing *go kaypro*.

Other SIGs are software-specific, and are sponsored by software vendors. Examples are LOTUS by Lotus Development Corp., MSOFT by MicroSoft and BORLAND by Borland International. If you're a programmer, check out the programmer's forum, PROSIG. Also look into PCS-55 (the Pascal Forum) and DR-FORUM, the Digital Research Forum. And, don't forget the computer art group, ARTSIG. To get a menu of all computer-related SIGs, type *go computers*.

## PLENTY OF VARIETY

Simply because CompuServe is a large computer system, don't think that computing is the only topic discussed. How about the political forum, HOM-41? Science and math education on SCI-

ENCE? Or the religious HOM-33?

Travel services are a natural for CompuServe. PANAM leads to the Pam Am Travel Guide, and the Travel Sig is HOM-157. West coast travel information can be accessed by *go westcoast*, and Sun and Sand Vacations lurk behind the command *go sas*. Don't forget the Official Airline Guide, OAG.

Are computer games your pleasure? CompuServe has a few:

- Blackjack (GAM-60)
- Dor Sageth (GAM-527)
- Football (GAM-27)
- Golf (GAM-21)
- Hangman (GAM-23)
- Lunar Lander (GAM-24)
- Megawars (MEGA1 through MEGA3)
- New Adventure (GAM-50)

For a list of games, *go gam-1*.

## DOWN TO BUSINESS

Most CompuServe forums are more serious. Various financial services are linked to the single address BANKING. There's a computerized checkbook balance at HOM-26. Market highlights are provided at MMM-46, and Standard and Poor's listings are at the obvious address S&P.

The federal government maintains services at various CompuServe addresses. Information from the Internal Revenue Service can be read with *go irs*. Military veterans' services are at VET, and the FBI Ten Most Wanted List is at TEN. Department of State international travel advisories can be checked with *go state*.

Aviators can find many support services from CompuServe, including aircraft insurance (AVL), rules and regulations (AVR), safety information (ASI) and up-to-the-minute weather (AWX).



## NEED HELP?

It's easier to use CompuServe support services under the new system: no need to memorize those CIS page numbers.

Changing your password is as easy as typing *go password*. Terminal type is specified by TERMINAL, billing information is at BILLING, and a list of access telephone numbers is at PHONES.

As mentioned earlier, hundreds of services exist on CompuServe, from SIGs to daily newspapers to electronic banking. One useful time-saver is more of a challenge under the new addressing scheme: kids will now have to type *go encyclopedia* for that invaluable resource.

Finally, here's how to get the complete list of CompuServe addresses: select option two after typing *go index*. It's wise to echo the list to the printer; it's longer than 10K, and it's handier in printed form.

## STATIC IN THE LINE

The higher-speed 1200 bit per second (bps) modems are becoming less expensive and more desirable to portable-computer owners. Even though many on-line services, including CompuServe, charge slightly more for a 1200 bps line, it's still less expensive — and much faster.

Many phone lines, however, aren't quite clean enough for high-speed telecommunications, and the error rate for 1200 bps is higher than for the built-in 300-bps modem.

If foreign-language characters creep in during a 1200-bps terminal session, try disconnecting and dialing up using the 300-bps modem. The session will seem interminably slow — but when downloading program information, accuracy is everything. And, remember the story of the hare and the tortoise. □

# We've done it again!!!

More super software for your Model 100, Tandy 200 & NEC PC8201A!

## MEN-U-TILITY

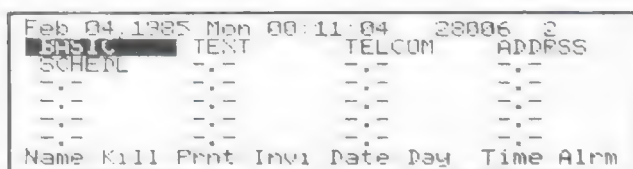
Men-u-tility is a powerful new utility for your Model 100. Once installed it is completely automatic and comes up when ever you would normally return to the main menu. As you move the cursor bar over the files, the length of each file is instantly displayed in the upper right corner. Men-u-tility adds 8 function keys to your main menu. You can kill files, rename files, make files invisible, set the day, date and time without ever leaving the menu

Men-u-tility is also a print formatter. With F3, you can print any .DO file to your printer and you decide the right and left margins, top and bottom margins and page length! F8 sets an alarm that will go off no matter what mode you are in, BASIC, TEXT, TELCOM, etc

If you have the Disk Video Interface (not required), the menu will appear on whatever screen you are using

Men-u-tility only requires 1.8K of RAM and won't conflict with your other machine language programs.(100)

**\$24.95**

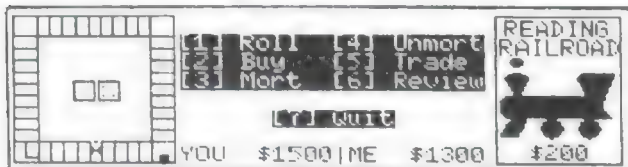


## LET'S PLAY MONOPOLY\*

It's you against the computer and the computer is a tough competitor. The computer makes all its own decisions. Super fast machine language graphics display the whole board at all times. You can tell at a glance who owns what property and the number of houses on each. It never takes more than 1 or 2 seconds for the computer to decide what to do. The computer is such a good player that you'll be lucky if you even win half of the time (100,200,NEC)

\*Monopoly is a trademark of Parker Brothers.

**\$29.95**



## ASSEMBLER

Our assembler is the answer to your assembly language programming needs. It has all the features you expect in an assembler and more! It requires less than 3K of your valuable RAM space and is relocatable to any convenient place in memory. There are several useful macros already built in. You can output all or any portion of the assembled listing to your screen or printer. An extensive 56 page manual covers the use of the assembler, the complete 8085 instruction set, useful sample programs and LOTS of information on the ROM and reserved RAM areas. (100,200,NEC)

**\$32.95**

## Melody Maker

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Bytefyter works on your BASIC programs just as they are, IN PLACE. It strips unneeded spaces and remark lines. But that's not all! Bytefyter is smart! Bytefyter combines the lines of the BASIC program to whatever maximum length you specify. Each line of a BASIC program takes 5 bytes just for the line number and pointer information. By combining lines, Bytefyter saves a tremendous amount of space, space that could be used for another program or text file. Bytefyter actually checks the logic of your programs and doesn't combine lines that would cause the program to crash.

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# That Compounding Interest

*With interest rates rising and falling like the tide, it's important to have a good understanding of their effects on investments. Your Model 100 can help you do just that.*

Reprinted from "Financial Decision Making With Your TRS-80 Model 100 Including 18 Programs" by Leslie Sparks (Book No. 1799), with permission of the publisher, TAB BOOKS Inc., Blue Ridge Summit, PA 17214.

The relationship between time and money is fundamental to financial decision making. You must understand this relationship in order to understand the economic consequences of your financial decisions; correct financial decisions are not possible without it. Once you do understand the relationship between time and money, you can analyze all kinds of financial situations, including insurance, retirement, loans, acquisitions of equipment and real estate and almost every other financial situation you are likely to encounter.

When you have a dollar, you can either spend it or you can invest it with the idea of spending it later. If you invest it, you are giving up the immediate purchase of goods and services. In order to justify this sacrifice, you expect to earn a profit on the investment. That is, you expect to get your dollar back plus a little extra to make up for the loss of the goods and services you could have purchased now. This profit is commonly called *interest*, and it is interest that makes people give up the immediate use of their money in hope of future gain.

The *time value of money* is important when you want to borrow or loan money. We will look at both situations and provide programs for the Model 100 that will carry out all the calculations necessary to make rational financial decisions.

## COMPOUND INTEREST

There are two kinds of interest, *simple* and *compound*. With simple interest only the initial amount invested earns interest. If we invest \$100 at 10 percent per year simple interest, we earn 10\$ annually. At the end of one year we have \$110, at the end of two years we have \$120, and so on.

With compound interest, *both* the interest and the initial investment earn interest. For example, if we invest \$100 at 10 percent compounded annually, we

earn \$10 the first year (10 percent of \$100). In the second year we earn interest on \$110, or \$11, in the third year we earn interest on \$121 (or \$12.10), and so on to the end of the investment period.

As you can see, your money grows much faster with compound interest than with simple interest. The math necessary to determine the results of compound interest is more difficult than that for simple interest — but not *that* much more difficult. With a computer the difference in difficulty really doesn't matter.

The formula for calculating the results of compound interest can be derived fairly easily. Because the entire concept of time value of money depends on understanding compound interest calculations, we will work out the equation one step at a time.

Suppose you want to invest \$1,000 at 10 percent interest per year compounded annually. You plan to leave the money for five years and want to know how much money you will have at the end of that time. We will work with the problem one year at a time, but first let's define some terms:

- PV (present value) = the value of your investment now (\$1,000)
  - FV (future value) = the value of your investment at some future time
  - r = the interest rate expressed as a decimal (0.1 in our example)
  - n = the number of compounding periods (in this case, 5 years)
- The future value of our \$1,000 at the end of the first year is given by:

$$\begin{aligned} FV1 &= PV + PV \times r \\ &= PV(1+r) \\ &= 1,000 \times 1.1 \\ &= 1,100 \end{aligned}$$

For the second year we calculate using FV1:

$$FV2 = FV1 + FV1 \times r = FV1(1+r)$$

But  $FV1 = PV(1+r)$ , so we can substitute that expression for FV1:

$$FV2 = PV(1+r)(1+r)$$

The third year we again substitute using  $PV(1+r)$ :

$$FV3 = FV2(1+r) = PV(1+r)(1+r)(1+r)$$

We can now generalize the formula as:

$$FVn = PV(1+r)^n$$

We can use this formula to answer our question.

$$FV5 = 1,000(1.1)^5 = \$1,610.51$$

If we had invested at simple interest, we would have earned only \$1,500.

It should be clear that we can solve the equation for any one variable if we know all the others. For example, the present value of a future amount is given by:

$$PV = FV(1+r)^{-n}$$

The present value formula is important because it tells us how much a given future value is worth today. In other words, the present value tells us how much we should be willing to pay now for the right to receive a given future amount.

We have been assuming that the compounding period was one year. The compounding period, however, can be any time period — daily, weekly, monthly, quarterly and so on. The interest rate is generally stated as a percentage per year. To use the formula above we both divide the yearly interest rate and multiply the number of years by the number of compounding periods per year. The formula thus becomes:

$$PV = FV(1+r/q)^{-nq}$$

where q is the number of compounding periods per year.

For example, if we were offered 10 percent interest per year compounded monthly, we divide 0.1 by 12 to get the interest rate per compounding period, and multiply 3 years by 12 to get the total number of compounding periods. (Note that the programs in this book require only that you enter the yearly interest rate and the number of compounding periods per year.)

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## TIME AND MONEY

*Compound interest program COMPND.BA*

```
1 REM COMPOUND INTEREST PROGRAM
2 REM VERSION 1.0 BY LES FOR MODEL 100
3 REM 9/83
4 REM FOR TAB BOOKS
5 CLEAR
6 DEFINT J,L
11 A$="1234567890+-"
12 AZ$=CHR$(13)+CHR$(31)+CHR$(30)+CHR$(42)+"M
    "+"m"
14 DIM F$(4),T$(5),X(5)
15 JR=16:
    JS=2:
    FORJ=0TO4:
        READF$(J):
        NEXTJ
16 FORJ=0TO4:
    READT$(J):
    NEXTJ
20 REM FOR TRS-80 MODEL 100 BY LES
40 J=1
45 NT=4
50 CLS:
    JF=0
60 PRINT STRING$(39,"=")
70 PRINT"COMPOUND INTEREST PROGRAM
72 PRINT "    version 1.0 by LES."
80 PRINT
85 :
    PRINTSTRING$(39,"=")
550 GOSUB 9000
560 REM FIND MISSING ITEM
570 J9=0
572 FORJ=0TONT:
    IFX(J)=0THEN J9=J9+1
574 NEXTJ
576 IFJ9>1THENCLS:
    PRINT" ERROR. TOO MANY UNKNOWNNS.":
    FORJ=0TO500:
        NEXTJ:
        GOTO550
578 J=0
580 IFX(J)=0THEN600ELSEJ=J+1
590 IFJ>NTTHENCLS:
    PRINT"YOU SPECIFIED EVERYTHING. ERROR.":
    FORJ=1TO400:
        NEXTJ:
        GOTO550
595 GOTO 580
600 JS=J+2:
    LC=0:
    ONJGOTO630,640,660,680:
605 PRINT2280,"    FINDING INTEREST RATE,"
610 C=X(4)/X(3):
    K=1/(X(1)*X(2)):
    R=C^K-1
620 R=R*100*X(2)
```

## TIME AND MONEY

```
628 X(0)=INT(1000*R)/1000:
GOTO550
630 PRINT@280,"CALCLATING NO. OF YRS.":
R=X(0)/100/X(2):
R1=1+R:
V=X(4)/X(3)
632 X(1)=LOG(V)/LOG(R1)/X(2)
638 GOTO 550
640 PRINT@280,"FINDING NR. OF PERIODS/YR":
LC=0:
N=1:
641 V=X(4)/X(3):
NL=1:
NB=2000
642 R=X(0)/100/N:
R1=1+R
643 XN=LOG(V)/LOG(R1)/X(1)
644 IFXN>2000THEN652
645 IF ABS(XN-N)/N<.000001THEN650
647 IFXN>NTHENNL=NELSENB=XN
648 N=(NL+NB)/2:
LC=LC+1:
IFLC>66THEN655 ELSE642
650 IF XN<1THEN657 ELSE X(2)=INT(XN+.5):
GOTO550LIST657.
652 CLS:
PRINT "ERROR ERROR >>>":
PRINT"NOT POSSIBLE TO GET ANSWER.":
PRINT"TRY NEW DATA.":
PRINT:
FORJ=0TO500:
NEXTJ:
GOTO550
655 CLS:
PRINT"ERROR. ERROR.":
656 PRINT "DID NOT CONVERGE. TRY NEW INPUT.":
FORJ=0TO500:
NEXTJ:
GOTO550
657 CLS:
PRINT"ERROR ERROR. ":
PRINT"LESS THAN ONE PAYMENT/YR.":
FORJ=0TO700:
NEXTJ:
GOTO550
660 PRINT@280,"CALCULATING PRESENT VALUE.":
R=X(0)/100/X(2)
665 X(3)=X(4)*((1+R)^(X(2)*X(1)))
670 GOTO 550
680 PRINT@280,"CALCULATING FUTURE VALUE.":
R=X(0)/100/X(2)
690 X(4)=X(3)*((1+R)^(X(2)*X(1)))
695 GOTO 550
9000 REM DATA INPUT
9001 REM (C) 1983 L.E. SPARKS
9002 REM MAY BE FREELY USED
9010 CLS
9015 PRINT "COMPOUND INTEREST PROGRAM"
9020 PRINT STRING$(39,"=")
```

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```

9040 FOR J=0TONT
9050 PRINTTAB(2) T$(J);TAB(21);
      PRINTUSINGF$(J);X(J)
9060 NEXT J
9065 IF JQ=-9THEN9800
9070 PRINT @ (JS*40)+JR,"-";
9075 PRINT@280,"ARROWS MOVE -\, * CALCULATES
      M RETURNS";
9080 Y$=INKEY$:
      IF Y$=""THEN 9080
9090 IF INSTR(A$,Y$)<>0 THEN 9500
9095 IF Y$="M"ORY$="m"THEN JF=-9:
      RETURN
9100 JZ=INSTR(AZ$,Y$):
      IF JZ=0THEN9080
9110 ON JZ GOTO 9120,9120,9140,9250
9120 PRINT@ (JS*40)+JR," ";
9122 JS=JS+1:
      IF JS>NT+2THEN JS=2
9124 PRINT@ (JS*40)+JR,"-";
9130 GOTO 9080
9140 PRINT@ (40+JS)+JR," ";
9150 JS=JS-1:
      IF JS<2 THEN JS=NT+2
9152 PRINT@ (40+JS)+JR,"-";
      GOTO9080
9250 RETURN
9500 PRINT @ (40+JS)+JR," ";
9505 PRINT@280,"ENTER REST OF DATA PRESSETER
      WHEN DONE";
9510 V$=Y$
9530 PRINT@ (40+JS)+18,V$;CHR$(95);" ";
9540 Y$=INKEY$:
      IF Y$=""THEN 9540
9550 IF Y$=CHR$(13) THEN 9700
9560 IF Y$<>CHR$(29) THEN 9600
9570 IF LEN (V$)=0 THEN 9530
9580 V$=LEFT$(V$,LEN(V$)-1):
      GOTO 9530
9590 Y$="":
      GOTO 9530
9600 IF INSTR(A$,Y$)=0 THEN 9530
9610 V$=V$+Y$
9620 GOTO 9530
9700 X(JS-2)=VAL(V$)
9710 JS=JS+1:
      IF JS>NT+2THENJS=2
9720 GOTO 9010
9800 JQ=0:
      PRINT@280,"PRESS * FOR PAY SCH, A FOR AND
      THER";
9810 Y$=INKEY$:
      IF Y$=""THEN9810
9815 IF Y$="*"THEN9830ELSEIFY$="A"THEN90
34000 DATA **.,####,##.,##,####,"$###,#####.##
      ", "$####,#####.##"
35000 DATA INTEREST,NUMBER YRS,NOPERIOD/YR,PR
      ESVALUE,FUTVAL,END

```

ing periods per year. The computer does all the calculating for you.)

## PROGRAM COMPND.BA

The Model 100 program COMPND.BA does all the calculations to solve compound interest problems. It is easy to use and quickly calculates the answer. To use the program you simply enter the variables you know and let the program calculate the missing one. If you enter too many variables, the program will tell you so, and if you enter too few it will also tell you. Tell the program that you want it to start calculating by pressing the \* key.

The following variables are present in compound interest problems:

- The present value (the value today)
- The yearly interest rate
- The number of compounding periods per year
- The number of years
- The future value (the value at a given future time)

The program can calculate any of the variables, provided all the others are known.

Figure 1: Beginning screen for compound interest program

```

=====
COMPOUND INTEREST PROGRAM.
=====
INTEREST      ->  0.000%
NUMBER YRS    0.00
NOPERIOD/YR   0
PRESVALUE     $0.00
FUTVAL        $0.00
ARROWS MOVE -> * CALCULATES M RETURNS

```

The beginning screen for the program is shown in Figure 1. To enter data simply enter the numbers and press ENTER. The screen will display all the data you entered and the cursor will move to the next line. You can enter data for any line by moving the cursor up or down using arrow keys.

Enter zero for the variable you wish to calculate. The program requires that one, and only one, of the variables be equal to zero. When you have entered all the data, press \* to start the calculations. If none or all of the calculations are equal to zero, the program prints an error message and returns you to the data entry form.

So now you've got it if you need it. Next time you do battle with a bank, go in prepared and knowing what to expect. □

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WRITE ROM — as its name implies — is on a snap-in ROM. You simply open the little compartment on the back of the Model 100 with a quarter and press WRITE ROM in. It's as easy as an Atari game cartridge. You can use other ROM programs like Lucid whenever you wish.

WRITE ROM lets you do every formatting function you'd expect, like setting margins, centering, right justifying and creating headers and footers. But it does them under function key control.

WRITE ROM remembers your favorite format settings so you can print a document without any setup, but you can change any formatting or printing parameter instantly with a function key.

WRITE ROM's "pixel mapping" feature shows you an instant picture on the screen of how your printout will look on paper.

In all there are 64 separate features and functions you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formatted or not) to any other computer over the phone with just a function key. What's more, it dials and handles sign-on and sign-off protocol automatically.

Third, WRITE ROM has a wonderful feature called Library that lets you record favorite phrases, words or commonly used expressions (often called boilerplate).

Any place you wish Library text to appear you just type a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer. Picture what you can do with that kind of capability.

WRITE ROM is blindingly fast. No one can claim faster operation. Because it is on ROM it uses virtually none of your precious RAM. It works with any printer, serial or parallel. You can make a duplicate copy of a document file under a new filename. Rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of this amazingly powerful piece of software. Dot commands allow control of such things as margins, centering, line spacing and other changes in the middle of a document. Most are WordStar™ compatible.

A mailmerge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature like superscripts that your printer supports, in a way that many users say "is worth the price of the program."

To underline you don't have to remember a complicated printer code. You just type CODE u, and to stop underline, CODE u again. The CODE key is to the right of your spacebar. Boldface? CODE b to start and stop. Easy to remember and do. Five different printer features of your choice.

We couldn't list all the features here. For example, you can select not just double space but triple or any other. You can use your TAB

key in a document. WRITE ROM allows you to indent. This means you can have paragraphs with a first line projecting to the left of the rest of the paragraph. WRITE ROM has a feature unique for any word processor on any computer. It's called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionnaires.

With FORM, any place that you had previously typed a GRAPH T and a prompt in a document, WRITE ROM will stop and show you that prompt on the screen. You can type in directly on the screen and when you press F8 you see the next prompt. It goes to a printer or a RAM file.

Think how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could use it for his entire questionnaire. You could construct a series of prompts to answer correspondence, typing the answers, even using Library codes. This feature lets you answer letters in rapid-fire fashion, each with personalized or standard responses.

Before WRITE ROM you had to be a programmer to create a series of prompts. Now it's as simple as GRAPH T.

PCSG makes the claim that WRITE ROM is the easiest, fastest and most feature-rich formatter for the Model 100. We're happy to offer WRITE ROM because it expands the 100 to a dimension of text processing you cannot equal on even larger computers.

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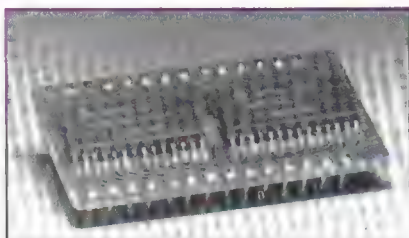
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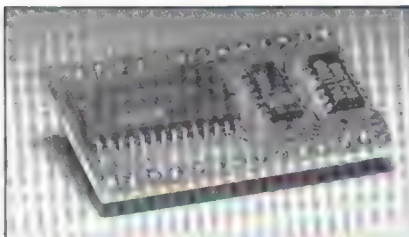
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Circle 49 on Reader Service Card

# A Super Input Routine

*Customizing input screens has always been something of a chore. This helpful little subroutine takes tedium out and puts versatility in.*

By Rick Rothstein

If you write programs for yourself or others, then you have probably run into the limitations of the various input modes available in BASIC. For example, have you ever wanted to display a "form" that allows more than a single input per line? If so, you became quickly, and painfully, aware of how easy it was to destroy your screen layout. If this, or other similar input related problems have ever plagued your programming efforts, read on.

Before buying my Model 100, I did all my programming on a TI-99/4A Texas Instruments home computer. What? Are those boos and hisses I hear? Well, they shouldn't be. The TI computer had an extremely powerful BASIC language available for it. And this BASIC contained some pretty remarkable commands.

One of these programming commands was called ACCEPT and performed as an extremely versatile extension of the INPUT command. With it, you were able to:

- accept data at any screen location;
- sound a tone to let the user know the program was ready to accept data;
- limit the *number* of characters that could be entered;
- limit the *type* of acceptable characters;
- provide default values for acceptance;
- provide full editing capabilities.

Now, if you're a Model 100 programmer you can have all the advantages of TI's ACCEPT command in your own programs. The following listing shows a BASIC language subroutine which simulates ACCEPT. Type it into your computer using TEXT. That way, when you want to include it in one of your programs, simply MERGE it in.

## SELECT SCREEN LOCATION

As you are no doubt aware, the Model 100 display screen is laid out as a grid, 40 columns wide by eight rows deep. It's possible to display text to the screen beginning at any one of 320 print positions. These locations are numbered

from zero to 319 starting in the upper left of the screen and progressing sequentially from left-to-right and top-to-bottom.

To begin printing text at a specific place on the screen, simply include the appropriate position numbers with the "@" symbol (Shift-2) in a print statement. For example, if you wanted to print the word HELLO beginning at the fifth column of the third row, you'd use: PRINT @84,"HELLO".

The ACCEPT subroutine uses the same numbering system coupled with a variable called AT. Hence, if you want to accept data at the fifth column of the third row, you'd need to set AT=84 prior to calling the subroutine.

If AT is set to a negative value, or a number greater than 319, the program will stop and display an error message. The AT variable must be set to the proper value before *each* call to the subroutine. If it is not reset, it uses the last defined value of AT.

## ALERTING THE USER

If you wish to sound an audible alert to indicate the program is waiting for data, set the variable called ALERT to any non-zero number. The default is ALERT=0, which is sound off. Once

set within a program, ALERT remains set for all subsequent calls to the subroutine.

If you'll *always* want the program to sound an alert, change the conditional test in line 60020 to a BEEP command. If you'll never want it, remove line 60020 altogether.

## SET INPUT FIELD SIZE

This option allows you to limit the size of a data entry field. That is, you'll be able to set the maximum number of characters a user can enter. Before calling the subroutine, set the variable SIZE to that maximum number.

If no value is assigned to SIZE, data will be accepted up to, and including, the last character position on the input line. If SIZE is negative, the program will stop and display a subroutine error. If SIZE is set equal to zero, or is larger than the number of spaces left in the input row, then SIZE will be adjusted to accept characters to the end of the line. SIZE=0 is the default for *each* and *every* call to the subroutine.

## MASK CHARACTERS

This is perhaps the nicest option available in this subroutine. You can determine *which* characters can be used.

USER NAME	VARIABLE NAME	DESCRIPTION
ALERT	AL	Determines whether to sound an alert to the user or not
AT	AT	Location for beginning of input field
SIZE	SI	Size of input field
	ZC	Subroutine column counter
	ZK	Reused three times within subroutine — as a flag to determine the first keystroke entered; as the ASCII equivalent of each keystroke; and as a loop counter when removing leading and trailing blank spaces
IN\$	IN\$	Contains the information inputted by the user
MASK\$	MA\$	A filter for inputted keystrokes
TEXT\$	TE\$	Working display string
	ZK\$	Keystroke entered by the user

*When writing your own programs, you should obviously not use variable names already taken by the subroutine. Here's a list of those variables.*

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## ACCEPT

In effect, you create a mask allowing certain characters to be entered while rejecting others. Rejection is signaled by an audible warning.

To create the mask, simply set the string variable called MASK\$ equal to the characters that will be permissible. For example, suppose you want only Y, N or ? (question mark) to be allowable answers to a question. You'd set MASK\$="YN?".

If MASK\$ equals a null string (i.e. MASK\$="") then *all* keystrokes are accepted. This is the default condition for every call to the subroutine.

### ESTABLISHING DEFAULT ENTRIES

There will be times when you'll want to suggest an answer in response to a question. For example, 1985 for the year. To do so, simply place the desired text into the string variable TEXT\$ (i.e. TEXT\$="1985"). Depending on the location defined by AT, that value will appear there by hitting the ENTER key. Any other keystroke will erase the displayed text and the program will accept data as entered.

### DATA ENTRY

Unlike other input modes available on the Model 100, ACCEPT is quite easy to use. Data entry and editing emulate the TEXT/EDIT modes of the 100. The cursor is non-destructive, meaning it can move across characters without erasing them. Since ACCEPT is a single-line input routine, cursor movement is either right (right arrow or Ctrl-D) or left (left arrow or Ctrl-S).

If you place the cursor over existing text and begin typing, the new entry will be inserted without overwriting any data.

Ctrl-left arrow or Ctrl-Q moves the cursor to the beginning of the data field and, conversely, Ctrl-right arrow or Ctrl-R will put it at the end.

The backspace key deletes characters *in front* of the cursor, while shift-backspace deletes characters *under* the cursor. To erase an entire line, press the escape (ESC) key.

Additionally, you'll hear a beep if the number of characters entered exceeds the size of the data field.

### HOW IT WORKS

One of the benefits of having this subroutine written in BASIC is that it can be modified to suit the programmer's needs. Responses to special keystrokes may be added or eliminated as desired. This is a distinct advantage over built-in BASIC statements.

Before you'll be able to modify this subroutine, however, it'll be necessary to know what each program line does. Note that variable names have been shortened in the listing (to two characters) to conserve memory.

• Line 59999: Ensures the program has a well defined ending point.

• Line 60000: Checks to see if SIZE and AT are within proper limits. If not, an error is displayed. If so, both are truncated to whole numbers, the break key is disabled and the screen is locked to prevent scrolling.

• Line 60010: If the number of character spaces left on the input line is less than SIZE, or SIZE=0, then the value of SIZE is adjusted to fill the remainder of the line.

• Line 60020: The column counter is set to one, and a second variable is set so that any default text is erased if enter key is not pressed. TEXT\$ is adjusted to

### The ACCEPT subroutine

```

59999 END
60000 IF SI<0 OR AT<0 OR AT>319 THEN PRINT " ",
      " ** SUBROUTINE ERROR ** ",
      :END ELSE AT=INT(AT)
      :SI=INT(SI)
      :POKE 63056,128
      :CALL 16959
60010 IF SI+AT MOD 40>40 OR SI=0 THEN SI=40-AT
      MOD 40
60020 ZC=1
      :ZK=0
      :TE$=LEFT$(TE$+SPACE$(40),SI)
      :PRINT @AT,TE$;
      :IF AL THEN BEEP
60030 PRINT @AT+ZC-1,CHR$(27);"P";
  
```

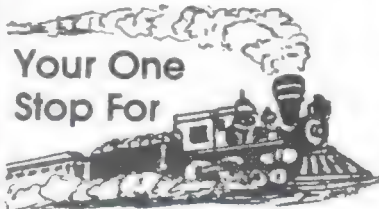
```

60040 ZK$=INKEY$
:IF ZK$="" THEN 60040
60050 IF ZK=0 AND ZK$<>CHR$(13) THEN PRINT
CHR$(27);"Q";
:TES=SPACE$(SI)
:PRINT @AT, TES;
60060 ZK=ASC(ZK$)
:IF NOT(ZK>31 AND ZK<>127 AND MAS="" OR
INSTR(MAS, ZK$)>0) THEN 60080 ELSE IF
RIGHT$(TES, 1)<>" " THEN SOUND 999, 5
60070 TES=LEFT$(LEFT$(TES, ZC-1)+ZK$+MID$(
TES, ZC), SI)
:PRINT CHR$(27);"Q";
:PRINT @AT, TES;
:ZC=ZC-(ZC<SI)
:GOTO 60030
60080 IF ZC>-(ZK=8) AND ZK=8 OR ZK=127 THEN
TES=LEFT$(LEFT$(TES, ZC-(ZK=127)-2)+MID$(
TES, ZC-(ZK=127))+ " ", SI)
:PRINT CHR$(27);"Q";
:PRINT @AT, TES;
:ZC=ZC-(ZC>=1)*(ZK=8)
:GOTO 60030
60090 IF ZK=28 OR ZK=4 THEN ZC=ZC-(ZC<SI)
:GOTO 60030
60100 IF ZK=29 OR ZK=19 THEN ZC=ZC+(ZC>1)
:GOTO 60030 ELSE PRINT CHR$(27);"Q";
60110 IF ZK=17 OR ZK=18 THEN ZC=-(ZK=17)-SI*(ZK=18)
:GOTO 60030
60120 IF ZK=27 THEN TES=SPACE$(SI)
:ZC=1
:PRINT @AT, TES;
:GOTO 60030
60130 IF ZK=3 THEN CALL 16964
:POKE 63056, 0
:END
60140 IF ZK<>13 THEN SOUND 9999, -5*(ZK<>8)
:GOTO 60030
60150 ZK=SI+1
:IF TES=SPACE$(SI) THEN INS=""
:GOTO 60180
60160 ZK=ZK-1
:IF ZK>0 AND MID$(TES, ZK, 1)=" " THEN 60160
ELSE TES=LEFT$(TES, ZK)
:ZK=0
60170 ZK=ZK+1
:IF ZK<SI AND MID$(TES, ZK, 1)=" " THEN 60170
ELSE INS=MID$(TES, ZK)
60180 SI=0
:MAS=""
:TES=""
:POKE 63056, 0
:CALL 16964
:RETURN

```

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INFORMATION  
615-892-2339



*This is an example program which uses the ACCEPT subroutine. It is totally nonsensical, but it will give you a feel for the various options available with ACCEPT. Just follow the on-screen prompts. WARNING: There is no error checking.*

```

100 DIGIT$="0123456789"
   :UALPHA$="ABCDEFGHIJKLMNOPQRSTUVWXYZ"
110 CLS
   :PRINT @3,"ENTER ANY DATE"
   :LINE(18,9)-(101,9)
120 PRINT @83,"MONTH:";SPACES(11);"DAY:";SPACES(4);
   "YEAR:"
130 LINE(54,25)-(109,25)
   :LINE(144,25)-(157,25)
   :LINE(198,25)-(221,25)
140 ALERT=1
   :AT=89
   :SIZE=9
   :MASK$=UALPHA$
   :GOSUB 600000
   :M$=IN$
150 AT=104
   :SIZE=2
   :MASK$=DIGIT$
   :GOSUB 600000
   :D$=IN$
160 AT=113
   :SIZE=4
   :MASK$=DIGIT$
   :GOSUB 600000
   :Y$=IN$
170 PRINT @163,"NOW ENTER ANYTHING YOU WANT TO"
180 LINE(20,44)-(194,58),1,B
   :LINE(21,45)-(193,57),1,B
190 AT=244
   :SIZE=28
   :TEXT$="ENTER OR REJECT THIS DEFAULT"
   :GOSUB 600000
200 FOR N=1 TO 150
   :NEXT
   :CLS
210 PRINT "YOUR DATE WAS ";M$;" ";D$;" ";Y$;" AND"
220 PRINT @80,"YOU TYPED: ";IN$
   :LINE(66,24)-(54+5*LEN(IN$),24)
230 PRINT @244,"PRESS 'R' TO REPEAT; 'Q' TO QUIT"
240 LINE(20,44)-(218,58),1,B
   :LINE(21,45)-(217,57),1,B
   :BEEP
250 IN$=INKEY$
   :IF IN$="" THEN 250
260 IF IN$="R" THEN 110 ELSE IF IN$<>"Q" THEN 250

```

equal SIZE and printed at the location defined by AT. A beep is sounded if the ALERT variable does not equal zero.

- Line 60030: The cursor is placed at the appropriate screen location and made visible.

- Line 60040: The keyboard is read over and over again until a key is pressed.

- Line 60050: If the first key pressed on this call to the subroutine is not enter, the cursor is made invisible, TEXT\$ is set to a number of blank spaces equal to SIZE and is printed to the screen (erasing any default text).

- Line 60060: The ASCII value of a keystroke is stored in the ZK variable. If ZK does not represent a printed character then program execution skips to line 60080. If it does, then the subroutine checks to see if the character will exceed the size of the input field and warns the user accordingly.

- Line 60070: If a valid, printable character is entered, then the keystroke is inserted into its proper location in TEXT\$, the cursor is made invisible and the new TEXT\$ is printed on the screen.

- Line 60080: Defines backspace and delete keystrokes.

- Line 60090: Defines right arrow or Ctrl-D keystrokes.

- Line 60100: Defines left arrow or Ctrl-S keystrokes.

- Line 60110: Defines Ctrl-Q and Ctrl-R keystrokes.

- Line 60120: Defines function of escape (ESC) key.

- Line 60130: Defines function of BREAK key.

- Line 60140: Warning sounded if ENTER is not pressed.

- Line 60150: ZK is set to one more than the value of SIZE. If TEXT\$ is all blanks, IN\$ is set to the null string and execution resumes at line 60180.

- Line 60160: First, ZK is decremented. Then, if ZK is not zero and if the ZKth position in TEXT\$ is a blank space, the loop is repeated. Otherwise, TEXT\$ is truncated (to remove any trailing blank spaces) and ZK is reset to zero.

- Line 60170: First, ZK is incremented. If ZK is not equal to SIZE and the ZKth position is blank, the loop is repeated. Otherwise TEXT\$ is truncated (to remove a leading blank spaces) and IN\$ is set equal to the truncated string.

- Line 60180: SIZE, MASK\$ and TEXT\$ are set to their respective default values. The BREAK key is re-enabled and the scroll lock is removed. The subroutine is exited. □

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Picture this. *Disk +* comes to you on a Snap-in ROM and a diskette for your desktop. You take a quarter and open the little compartment on the back of your Model 100. Then you just press the ROM into the socket. *Disk +* appears on your main menu just like a built-in.

You connect your Model 100 to your other computer using an RS232 cable (available from PCSG for \$40).

You just place the *Disk +* diskette into the desktop's drive and turn on the computer. It powers up automatically and says "awaiting command" on your desktop's screen. Then you just put the widebar cursor on the Model 100 main menu on *Disk +* and press ENTER. You are shown your RAM files arranged just like the main menu.

To save a file to your other system's disk drive, you just move the widebar cursor to the file you want to save and press ENTER. It is saved instantly with no further action.

To look at the disk directory, you just press a function key on your Model 100. You see immediately the disk directory on your Model 100 screen, and it is arranged just like your Model 100's main menu.

To load a file from the diskette to your Model 100, you just move the widebar cursor to the file and press ENTER. The file is transferred to your Model 100's RAM instantly. You can press F8 and go back to the main menu, and the file you loaded from diskette is there, ready to use.

It is so nice to be able to keep your documents, programs (both BASIC and machine code) and *Lucid* spreadsheet files on the diskette, and bring them back when you need them. All files are ready to run or use with no changes or protocol by you.

---

**If you have access to a desktop computer and don't have *Disk +*, then evidently we have done a poor job telling you about it.**

---

All files and programs that you load or save, go over and come back exactly as they are supposed to be because of full error checking. This guaranteed integrity is really a comfort. *Disk +* is wonderful in so many other ways. For example, you can do a "save all" of all your RAM files with just a touch of a function key. That group of files is saved on the diskette under a single filename with a .SD (for subdirectory) extension. Any time you want, you can bring back all those files at once, or just one or two if you like, again with one-button ease.

*Disk +* takes up no RAM. That's zero bytes either for storing the program or for operating overhead.

What really excites most *Disk +* users is text file cross compatibility. Your Model 100's text files are usable on your desktop computer, and your desktop's text files become Model 100 text files.

This means you can write something on your Model 100, and with *Disk +* transfer it

instantly to your desktop and start using it right away on your bigger computer. Or the way we like to work is to type in a document on the desktop computer and then transfer it to our Model 100 with *Disk +*. Then we print out the document, beautifully formatted, using WRITE ROM.

*Disk +* works with just about every micro sold, from IBM PC and its clones, to all Radio Shack computers (yes, all), to Apple II, Kaypro, Epson and most CPM. Just ask us. More than likely, your computer is supported.

Incidentally, hundreds of Model 100 owners have gone to their Radio Shack stores and bought a color computer because it is so low priced, and with *Disk +* they have an inexpensive disk drive.

And if that weren't enough, how about this: *Disk +* also provides cross-compatibility between different computers like IBM, Apple or the Model 4 using the Model 100 as the intermediary device. Quite a feature!

The snap-in ROM is really great because you can use other ROMs like *Lucid* or WRITE ROM. They snap in and out as easily as an Atari game cartridge and you never lose your files in RAM.

Anyone who ever uses *Disk +* simply can't do without it. But so many times we have had new users call us and say, "Wow! I had no idea when I ordered it that *Disk +* would be so fantastic. I just couldn't believe that I could use my desktop computer's disk drive with my Model 100 just like it is another main menu."

That's why we sell *Disk +* on a thirty-day trial. If you aren't completely satisfied, return it within thirty days for a full refund. Priced at \$149.95 on Snap-in ROM. MasterCard, Visa or COD.

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**A**xonix Corporation has announced an inexpensive video interface that allows you to connect your Model 100 or NEC 8201 to a monitor or television set.

The ThinVid connects to the microbus port on either computer and provides a monochrome composite or video output for driving an external monitor.

ThinVid allows the use of an inexpensive portable TV for a full page text display of 80 characters by 25 lines. An optional internal rechargeable battery pack gives continuous operation with external monitor for up to eight hours between charges. The standard composite output is capable of directly driving several monitors and can interface directly to most commercial VCRs.

ThinVid's compact size (six by five by two inches) and low weight (1.5 pounds) means easy portability. Mobile chargers are also available for automobile charging and DC operation.

ThinVid retails for \$249.95. The optional battery pack is \$49.95.

Contact Axonix Corporation, 417 Wakara Way, Suite 130, Salt Lake City, UT 84108, (801) 582-9271.

*Circle No. 104*

## Speaking of Bigger Screens

**A**ddressing an important concern of laptop customers, NEC has introduced a larger LCD screen for their PC-8401A "Portable Office."

The new model displays 80 by 16 characters on a 9.5 by 3 inch LCD screen. Resolution remains unchanged at 480 by 128 dots. This means larger dot size and thus bigger characters. The end result is better legibility.

Despite the larger screen, the PC-8401A weighs under six pounds. Battery life is unchanged with over eight hours of continuous use.

The "Portable Office" comes with built-in word processing and spreadsheet software. In addition, it can run third party packages such as DBase II,

SuperCalc and Multiplan in desktop mode.

The PC-8401A is available at a retail price of \$999. Contact NEC Home Elec-

tronics (U.S.A.) Inc., 1401 Estes Avenue, Elk Grove Village, IL 60007, (312) 228-5900.

*Circle No. 105*





### Life Never Ending

**E**ver stop to think how many AA batteries you've bought for your portable during its lifetime? Worse yet, have you considered how many more you'll have to buy?

Computer Coverup, Inc. of Chicago, IL has introduced a rechargeable, maintenance free battery pack that provides up to six hours of operation and fits in a briefcase.

The power supply features a voltage meter which safeguards against low voltage shutdown. Its 12-volt nickel cadmium battery carries a one year warranty and is fused to protect valuable equipment.

Contact Computer Coverup, Inc., 1740 N. Marshfield, Chicago, IL 60622, (800) 282-2541.  
Circle No. 106

### BASIC Help

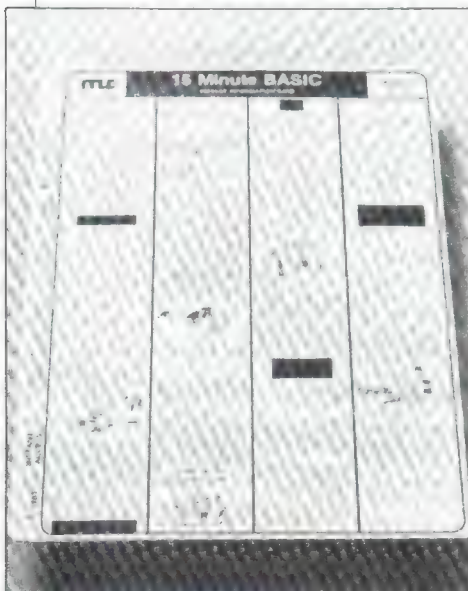
**I**f you've been waiting for a quick and easy way to learn how to write BASIC programs, help is on the way.

From Micro Logic Corp. comes their Micro Chart #12 entitled *15 Minute BASIC*. It's a standard page-size reference card which uses simple language and illustrations to get you programming fast.

It assumes no prior programming knowledge and covers such elementary topics as fundamental statement types, variables, formulas, strings, arrays, functions and more.

Micro Charts are available with a money back guarantee for \$5.95 (plus \$1.00 postage). Contact Micro Logic, Dept P, POB 174, Hackensack, NJ 07602, (201) 342-6518.

Circle No. 108



### Command Performance

**A**s any programmer knows, all printers have their own idiosyncrasies. What prints beautifully on one, looks horrendous on another. Hours are spent trying to find the command that's causing the problem.

Cardinal Point Inc. has just published something to ease the frustration. Called the *Programmers' Handbook of Computer Printer Commands*, it's a compilation of printer control codes of daisy-wheel and dot matrix desktop printers manufactured during and before 1984.

It lists control codes for more than 170 printer models made by 43 manufacturers. Codes are listed in table format alphabetically by manufacturer and subdivided by model.

Tables list a text version of the codes as well as decimal and hexadecimal equivalent (or octal where needed) and a brief description of the code's function. The book also contains names and addresses of all manufacturers.

The retail price is \$37.95. Contact Cardinal Point Inc., P.O. Box 596, Ellettsville, IN 47429, (812) 876-7811.  
Circle No. 107

### Modem Savior

**F**earful of damaging telephone line spikes caused by lightning, spherics or phone office switch gear? Then you might look into a modem protector.

Based on the same principle as an electronic surge protector, the Kleen Line Security system uses modern two stage semi-conductor and gas discharge suppression techniques to ward off dangerous spikes.

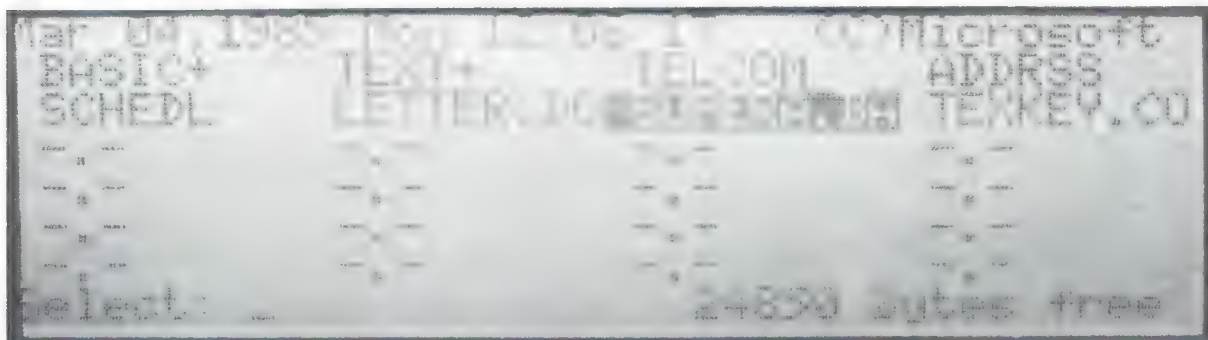
It comes in two models. One is for standard four pin modular connectors (RJ-11) and the other for eight pin connectors (RJ-45).

Kleen Line is priced at \$69.95. Contact Electronic Specialists, Inc., 171 South Main Street, P.O. Box 389, Natick, MA 01760, (800) 225-4876.

Circle No. 109



# The Model 300 Is Here... You Already Own It!



## SUPERA: Like Getting A Whole New Computer

In January 1983, Micro Demon introduced PRO AID. Suddenly Model 100 users found that their computer had capabilities far beyond their expectations. In his InfoWorld review of PRO AID, Reviewer Greg Springer, anticipating the announcement of the Model 200, wrote,

***"PRO AID adds enough new capabilities to the current model that the wait for upgraded portability is made much easier and maybe even unnecessary."***

Well, the Model 200 is here. But so is SUPERA! SUPERA takes a giant step past PRO AID, and adds a multitude of powerful new features to the Model 100, making it into the computer it was meant to be.

Once it is loaded, SUPERA works transparently to you and your programs. If it weren't for all the wonderful things it does, you would never even know it was there. If you want to remove it, SUPERA is as easy to take out as KILLING a BASIC program.

### Unique Format

SUPERA loads and runs as if it were a BASIC program (it's really all machine language). Because of this unique format, SUPERA is compatible with most other software and hardware. It also only requires 4.3K of memory.

With SUPERA installed, every facet of your computer suddenly takes on an aura of new-found power.

### In Text

While in TEXT you can

- Use a really fast and flexible search and replace function.
  - Turn on a special type-over mode in which typed characters replace text instead of being inserted.
  - Read a second file while editing a first.
  - Use control keys to delete words and lines, to change the case of the character under the cursor, and to activate the paste key.
  - Cause the display to scroll slowly up or down a line at a time.
  - Redefine special keys to act as SHIFTeD keys, control keys, or graphics characters.
  - Turn the computer off without losing your place.
  - Access special HELP files.
  - Use 26 new macro function keys.
- and more!

All of Supera's editing features become available whenever you enter EDIT mode to edit a BASIC program.

### Super Function Keys

A great deal of SUPERA's power comes from its 26 macro function keys. These easy to define keys can be used in TEXT, TELCOM and BASIC. Each key generally defines a string of 14 characters, but in both BASIC and TEXT several keys can be concatenated into one so as to provide longer keys. The power of these function keys is hard to imagine until you try them.

In TEXT they can provide you with much more than just easy entry of boiler-plate strings. They can also be defined to automati-

cally carry out complicated editing sequences.

In TELCOM these keys can save you money while accessing a data base such as Compuserve. They also save you the trouble of remembering such things as passwords, ID numbers, and special commands.

In BASIC use the keys to enter BASIC commands, and to facilitate typing in programs, to name just a few applications.

Moreover, SUPERA allows you to save and load entire sets of function keys by a single control key action. Thus you might keep a set of keys called TEXKEY.CO handy to use in TEXT, another keyset for BASIC, and yet another for TELCOM.

### In BASIC

You get the 26 function keys, and also

- Single stroke access to the built-in software such as TEXT and TELCOM
- Automatic Line Numbers
- Control key activation of selected BASIC commands
- You can redefine special keys

### In Menu

You can use control keys to kill and rename files.

### Calculator Mode

From BASIC you can enter an entirely new mode called Calculator mode. While in this mode you can quickly and easily evaluate expressions. Calculator mode also provides several new BASIC functions.

### Better Than PRO AID

It's true that PRO AID was a significant enhancement to the Model 100, but SUPERA goes far beyond it. In a message on the Compuserve Model 100 SIG, system operator Dave Thomas said,

***"Now with SUPERA, the original PROAID has been enhanced beyond belief... If there is a single, more useful utility on the market for the Model 100 than SUPERA, I haven't heard of it and t'would boggle my mind if t'was!!"***

### TEX PRO For Word Processing

TEX PRO consists of ALL the TEXT editing features of SUPERA, uses only 2.8K of memory, and sells for just \$49.95. It may be the choice of those who seldom use their Model 100 except for word processing, and don't need all the additional power of SUPERA.

**MICRO  
DEMON, INC.**

For more information or to order, write to Micro Demon, Inc., P.O. Box 50162, Columbia, SC 29250. Or call 803-733-0980 anytime. SUPERA \$79.95, TEX PRO \$49.95. Add \$3.00 for shipping. Visa and Mastercard are welcome.

**Changes your Model 100 into a totally different computer with capability you never thought possible.**

**Lucid<sup>TM</sup>**  
on Snap-In<sup>TM</sup> ROM

Infoworld  
rated Lucid's  
performance  
"excellent"

**NOW  
AVAILABLE  
ON  
M-200**

**PCSG says "Satisfaction Guaranteed  
or your money back within 30 days!"**

LUCID<sup>®</sup> is here now. It is on a ROM cartridge that snaps into the compartment on the back of your Model 100. It takes no memory to load and no memory for operating overhead. That means you have the full 29.6k bytes free to store your data.

First, LUCID<sup>®</sup> is memory conserving. It will let you build a large spreadsheet—255 row by 126 column capacity. You build huge spreadsheets in your Model 100's RAM that could consume 80 to 100K on a desktop computer.

Secondly, LUCID<sup>®</sup> is fast. LUCID<sup>®</sup> is so rapid, a 36 column corporate financial statement took less than 4 seconds to calculate.

Thirdly, LUCID<sup>®</sup> has features you won't find in most other spreadsheets. For example, when you type a label (text) it will cross column boundaries; in other words when you type a label or title it will appear as you type it irrespective of column or width. LUCID<sup>®</sup> also allows you to set column widths individually, and of course LUCID<sup>®</sup> has insert row and insert columns, as well as other standard features. LUCID<sup>®</sup> even lets your formulas refer to cells in other spreadsheet files.

Further, LUCID<sup>®</sup> has what no other spreadsheet has: Cut, Copy, and Paste. It uses the same keys as Cut and Paste in TEXT, but here's the difference: it takes all the formulas with it when you paste and they all automatically recalculate with the entire sheet.

And here is what is really amazing. You can copy or cut from one spreadsheet and paste into another spreadsheet or even a TEXT file.

LUCID<sup>®</sup> supports all BASIC math functions as well as Log, sine, cosine, tangent, exponentiation and other sophisticated math functions.

LUCID<sup>®</sup> has so many features that you will say "this is what I need in a spreadsheet"; such as automatic prompting of an incorrectly typed-in formula showing just where the mistake was made.

LUCID<sup>®</sup> has expanded "go to" functions that remember and produce a windowing capability.

But perhaps most remarkable is that LUCID<sup>®</sup> is not only a spreadsheet but a program generator as well. First, LUCID<sup>®</sup> lets you protect all cells against entry or change, and then unprotect just the cells you want for someone else to use as input fields.

LUCID<sup>®</sup> will not only process values, but text input as well so that the facts other than numbers can be responded to. LUCID<sup>®</sup> has the ability for you to refer in a formula to cells containing words. This feature combines with the capacity of doing "if then" statements that work by doing table look-ups against even massive X/Y charts of text or numerical information. You can produce a program that responds to inputs with no programming knowledge whatsoever.

You can prepare a report section in your spreadsheet with instructions to your user for printout, and they can produce a personalized printout that responds to their input. All your formulas and tables that did the calculations and provided the facts are invisible to that user. LUCID<sup>®</sup> is useful for doctors for patient questionnaires, troubleshooting technicians, purchase clerks, people doing job quotes, stores for customer workups, insurance agents and anybody who needs to process specific facts and numbers to produce a report based on those responses.

LUCID<sup>®</sup> comes with a manual that explains not only the characteristics of LUCID<sup>®</sup> but will train you how to use a spreadsheet even if you have never seen one before. You are shown how to do budgets, forecasts, breakeven analysis amortizations and many other types of personal and business reports and calculations.

User friendly is such an over-used term in this industry, but a typical comment has been "I have never seen a spreadsheet that does so much, and yet LUCID<sup>®</sup> is so much

easier and faster to use."

LUCID<sup>®</sup> is a result of a most exhaustive developmental effort in which PCSG's objective was to develop a spreadsheet that was better than the state-of-the-art. We are so pleased because LUCID<sup>®</sup> provides for the Model 100 spreadsheet capability you cannot equal on a desktop computer.

LUCID<sup>®</sup> is, in our opinion and that of those who have examined it, a breakthrough. We sell it on a 30 day trial. If you are not completely satisfied, return it within 30 days for a full refund. Priced at \$99. on snap-in ROM. MasterCard, Visa or COD.

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# WHAT YOU SEE AND WHAT YOU GET

## T-View 80

Display enhancement program for the Model 100 and NEC PC-8201

Version 1.00

Traveling Software

11050 Fifth Avenue NE

Seattle, Washington 98125

(206) 367-8090

\$39.95

Circle No. 146

By J.R. WILSON

**T**rying out new computer programs is a lot like going out on a blind date. A beautiful package and great build-up may conceal a contentious personality and lack of intelligence. On the other hand, the date you first think is average at best may on closer inspection blossom into something of which dreams are made.

But there's also a third category. One you might compare to kissing your sister. All of the elements are there, but it just doesn't *do* anything for you.

Which brings us to one of the latest offerings from Traveling Software (TS), the T-View 80. Their ad proudly proclaims that T-View 80 produces readable displays in eight lines by 60 columns on your portable's screen.

Well, I can vouch for that.

They note the display has full upper and lower case characters, with descenders.

Indeed it does.

You can use it in TEXT or TELCOM. Quite right.

You can view previously created copy or enter new copy in the enhanced mode and paste the latter into any document at any point.

True, again.

They claim you can scroll left or right and, by doing so, see what your copy will look like at a full 80 columns.

Well, almost. Actually, the version tested shorted you by two columns. If you set your T-View 80 width at 65, for example, don't expect to get the same results if you then print out that document with a line length of 65. If, however, you set your printer's line width to 63, you'll get exactly what you saw on the screen.

This peculiarity holds true no matter what line length you set, from 10 to 80 (you can't exceed 80, so the most you can see and print is 78). But it's not a major problem and, as the ad claims, you definitely are seeing more text on your screen at one time than with the standard display.

## AND THEY SAID IT WAS IMPOSSIBLE

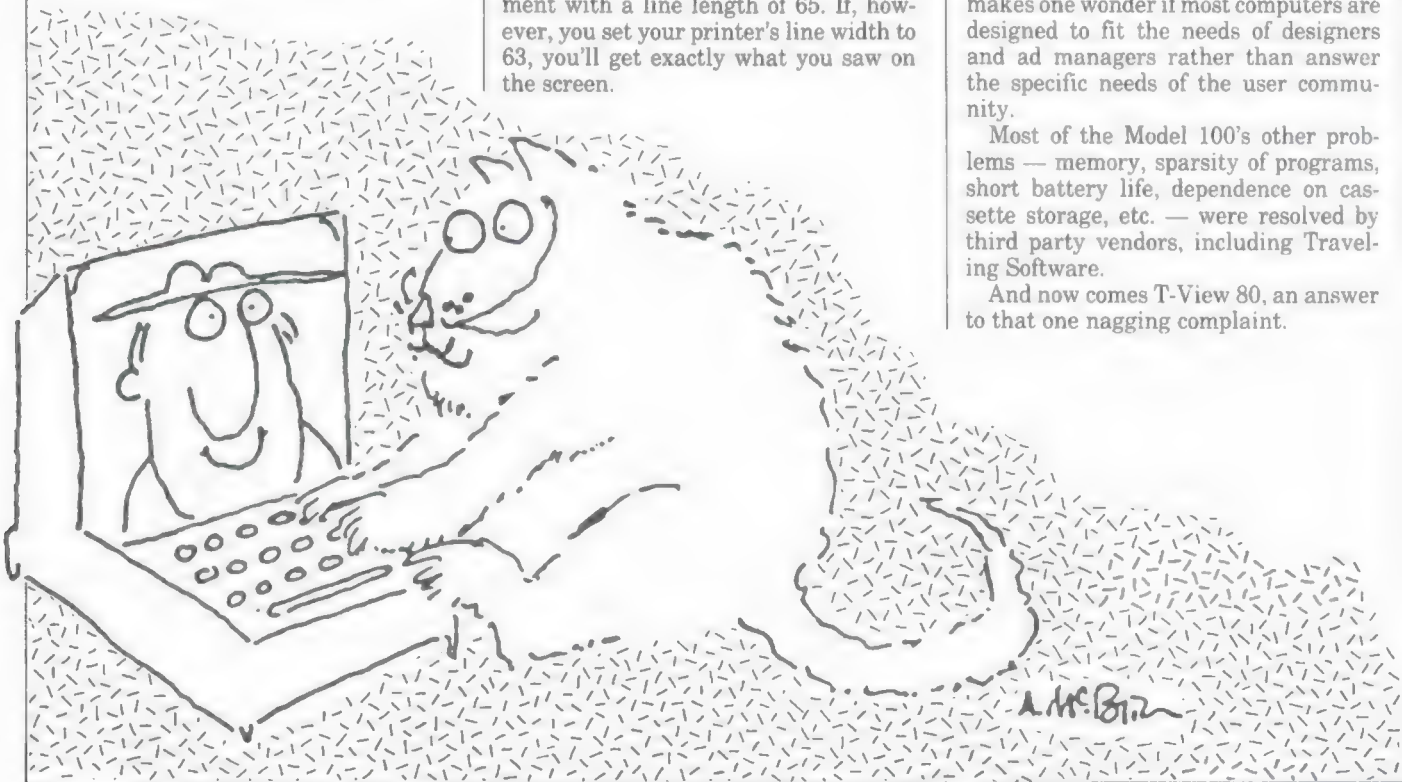
Probably what Tandy really said with regard to the 100's display was more along the lines of, "Here's what we decided was best for you. So take it and like it."

From the outset, screen size has hardly been the 100's greatest selling point. In fact, the eight line by 40 column display (duplicated on its sister machine from NEC) has probably drawn more complaints than almost anything else about the little darling.

Tandy's answer, with the Model 200, was to give you more *lines*, but no more columns. Hardly satisfactory, which makes one wonder if most computers are designed to fit the needs of designers and ad managers rather than answer the specific needs of the user community.

Most of the Model 100's other problems — memory, sparsity of programs, short battery life, dependence on cassette storage, etc. — were resolved by third party vendors, including Traveling Software.

And now comes T-View 80, an answer to that one nagging complaint.



## BUT DOES IT SING AND DANCE?

After using it in all of its stated applications, after trying hard to work up a cheer, I must admit I'm left with only a resounding "So what?"

There may well be some people who could find 60 columns on the screen instead of 40 a worthwhile improvement — or horizontal scrolling to see another few columns an additional gain. It certainly would be an aid to spreadsheet users or others who are working with columns. And, if you keep an eye on that disappearing two columns, it can help you see what your copy will look like before you commit it to a printer.

But it would seem likely by now that most Model 100/200 users have come to grips with the 40 column format. Stuffing another 20 onto the screen doesn't seem like such a major breakthrough.

And it isn't a perfect exchange, either. For example, if you use non-printing control codes, be aware that the enhanced viewing mode eliminates them from the screen. It also makes some characters difficult to interpret.

T-View 80 does have all the Traveling Software niceties: A clear, well-written manual; an audio tutorial; the seemingly ever-present Memory Manager program tossed in for free. And, it's easy to use.

It does create a few headaches, however. If you're using any other machine language programs, you must *manually* clear high memory.

In its TEXT-80 mode, you can view an existing file, create a new file or paste in copy created in the ENTRY-80 mode. While in the enhanced mode, you can change the number of columns per line, move through the copy screen by screen (or set the program for automatic vertical scrolling). You also can scroll horizontally, in units of one, five or 20 columns at a time.

ENTRY-80 allows just that — you can create text in the enhanced mode. You cannot, however, edit any line but the one you are on at the time. You can adjust the text width and scroll horizontally.

Everything created in ENTRY-80 is stored in the Model 100's paste buffer. Exiting ENTRY-80 returns you to the main T-View 80 menu, where you can call up an existing file or create a new file and, using the PASTE key, transfer into it the text you created in ENTRY-80.

Again, this seems of little real value unless you are dealing with material in columns.

TELCOM-80 is identical to the Model 100's built-in TELCOM. But you can enter the enhanced mode (with 60 columns or whatever) by hitting the down arrow from TELCOM's terminal mode.

The first time you try this can be a bit of a shock, because what you'll have is a blank screen. There are four available functions, although they are not labeled.

Pressing F1/D allows you to download text files from other computers, with the copy appearing on the Model 100 screen in the compressed T-View 80 character set. Basically, this operates the same as the standard download procedure.

Pressing F1/W allows you to set the width, from 10 to 80 columns (sort of).

F1/S is a strange little function Traveling Software calls the "Snoopy" mode. Basically, it puts back those non-printing control characters that T-View 80 zaps. The idea is, if you are having trouble with a file created by another computer, try loading it with "Snoopy" on to see if the problem stems from unusual control codes.

The final function simply returns you to the primary terminal mode by pressing F8.

So, there it is. If you need it, T-View 80 may be your dream date. But it would seem to me that most users would be better advised to spend the \$40 on something a little more useful — say Traveling Software's T-backup or Idea — and keep on plugging with the old "eight by forty." □

## A Friend Indeed

### Disk-Buddy 5.0

12 utility programs for DVI users  
BuddySystems  
220 W. 24th St.  
New York, NY 10011  
\$39.95  
Circle No. 143

By J.R. WILSON

**C**ut your losses. The phrase is all too familiar to politicians, soldiers and those who struggle with the constant change — and frequent chicanery — found in the personal computer industry.

On rare, happy occasions, someone will hold out a helping hand, enabling the battle-weary user to "cut his losses" with at least a modicum of self-respect. For those unfortunate souls who shelled

out large sums of money for Tandy's Disk/Video Interface (DVI), such help is now available.

The DVI is, quite frankly, an overpriced, under-supported disaster that can lead normally calm individuals to join the ranks of neo-Luddites and gleefully commit acts of computericide.

While Disk-Buddy can do nothing about the hardware problems, it does at least provide a welcome software aid to maintaining and copying files. More importantly, it offers the ability to run BASIC programs from disk without tying up RAM. And for programs using separate SPEC files, such as Tandy's Scriptit 100 and Portable Computer Support Group's Write Plus, it allows for the storage and simple use of custom formats.

The Disk-Buddy Pak also contains a host of supplemental programs that sort, transfer, append and perform other utility functions, most at the stroke of a single function key. Chief among those is RAM-Pal, which provides a single-stroke approach to saving files from RAM and can be used even without a disk drive attached.

## DARK CLOUDS, SILVER LININGS

As all computer users know, every silver lining comes with a dark cloud. For Disk-Buddy, the biggest cloud is its documentation, which tends to be somewhat disjointed, assumes too much knowledge on the part of the user and fails to give examples.

(These are the standard problems associated with most software and hardware manuals and cited in nearly every review ever written. This leads one to believe that those who persist in producing such muddled documentation do not read reviews — or, more likely, don't read their own manuals.)

Some patience and experimentation will get you through the Disk-Buddy manual, however. Things also will go faster when you learn to skip past the commercials. For reasons known only to the author, the D-B manual shamelessly interrupts itself to hawk additional disk drives, power strips, monitors and printer buffers. A bit much for a 22-page document.

One program actually accounts for a quarter of the 12 programs listed. Two are alternates: DB5 for dual-drive systems, DB5.SNG for single drive units. The third, DBLOAD, takes up only 90 bytes and is all you really need in RAM. The main program, which occupies about four kilobytes (K), must be saved to your working disk.

# The Ultimate Battery System for your Portable Computer



**Prairie Power™** introduces a brand new battery, charger and carrying case that greatly extends the power and efficiency for lap-top computers such as the Tandy 100 & 200, NEC 8201, 8401, Apple IIc, Epson and Sord.

The heart of the **Prairie Power** system is the lightweight rechargeable battery pack that can, for example, power the Tandy 200 up to 160 hours. By comparison, its "AA's" last a mere 10-15 hours. By the time a Tandy 100 has used up 10 packs of "AA's" **Prairie Power** is ready for its first charge (180 hrs.) Our new battery system can even power the Apple IIc for 8 hours and contains a sophisticated circuit to warn when the battery is low.

## A Compact System!

The **Prairie Power** system fits under any airline seat and measures only (17x13x5"). With Tandy 100, battery, case and charger, weight is only 12 lbs. Apple IIc system weighs 20 lbs. Battery is fully rechargeable, sealed, maintenance free, useable in any position and air transportable. Never again worry over shelf-worn "AA's"



The new two-step charger simplifies recharging by showing when the battery is charged and then switches to standby. You always know the battery is charged and ready-to-go, whether for emergencies or long trips on the road. Besides the assuredness and efficiency of a powerful battery system, **Prairie Power** will pay for itself over the cost of "AA's".

Best of all, the battery system and computer are housed in a handsome water-resistant padded Cordura case protected by support panels and thick foam inserts that hold computer, battery, charger, cables and accessories. A padded pocket can also hold a flat-panel screen, small recorder or 3.5 "drive and manuals. **Call our toll-free number today!**



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# NEW! MODEL 100 3-in-1 ROM Interactive Solutions\*

All the software that you will ever need  
on the Model 100 Portable:



- 1— Data Base
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- 3— Word Processor  
with Mail Merge

Now on a plug-in ROM. *Integrated* and easy as 1-2-3!

## Interactive Solutions

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COMPUTER CENTERS

■ **The Data Base** turns your Mod 100 into a personal filing system. You can store, examine, update select, sort and list a wide variety of information - from personnel records and inventory facts to appointment schedules and client lists.

■ **The Spreadsheet** turns your Mod 100 into a powerful decision tool. It is a full featured spreadsheet with 99x99 cells and provides fast decimal arithmetic in formula computation with complete range of scientific functions.

■ **The Word Processor** uses the Text editor of Mod 100 and gives you additional features for formatting and printing. You can set margins, line/para spacing, justify, define header/footer and use special print features like underline, **boldface**, etc.

In fact, the **Interactive Solutions** *integrates* all of your data information in Mod 100. With a touch of a function key, you can easily:

- Select and move items from **Data Base** files into **Spreadsheet** columns.
- Generate a report in **Data Base** program and move to the **Word Processor**.
- Cut any part of **Spreadsheet** and move to the **Word Processor**.
- Merge the items (like names, addresses) from **Data Base** files into a **Form Letter** and generate multiple letters or labels.

*All this and much more in a 32K bytes ROM from*



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Fort Worth, Tx. 76102  
Tel: 817/390-2762 Tlx:756916

See us at Booth M100  
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November 20-24, 1985  
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Las Vegas, Nevada

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Disk-Buddy assumes there is a monitor hooked to your system. If not, you can switch to the LCD by hitting the ESC key. If you never use a monitor, the manual explains how to modify the program accordingly.

Each disk can be assigned a title using one of the nine remaining programs, TITLE.BUD, which accepts titles up to 128 characters, but only displays 40.

## MORE PROGRAMS, MORE FUNCTIONS

When called up on your screen (CRT or LCD), D-B displays the number of free bytes remaining on the current disk. The manual warns, however, that this is an estimate — and an invariably generous one, at that — and should be viewed as such.

It would be nice to get a quick display of individual file size, as well. Disk-Buddy provides this function through the use of an auxiliary program that must be called up separately. This probably isn't worth the trouble for most users.

Disk files are displayed in three columns. Text and ASCII files have a blank space before the extension, if any, while BASIC and system files display a dot. The cursor control keys can move the display up or down as needed if the number of files exceeds the screen display space.

Some functions are duplicated on the main menu. For example, with the wide-bar cursor over a file name, the Enter key will load and save a TEXT file or

run (but not save) a BASIC file. Function key 2 (LOAD) accomplishes the same purpose.

Any TEXT file extension on disk is ignored and saved to RAM as FILE-NAME.DO. This lets the user maintain specialized files on disk, then transfer them to RAM without renaming them.

For example, let's say you have separate business, personal and group ADRS files. On disk, these might be named ADRS.BIZ, ADRS.PER and ADRS.PTA. When loaded to RAM, each becomes ADRS.DO and is ready to be called by the various programs that interact with ADRS.DO. The manual also warns that, because of this feature, you will overwrite any existing RAM file with the same filename.

BASIC files run using either approach are stored in the Model 100's BASIC buffer. A BASIC file loaded in this way can be accessed, run or edited until it is either saved to RAM from BASIC, another program is loaded or you type NEW.

TEXT files can be transferred to cassette, viewed on the screen or sent to a printer directly from disk, the latter with embedded printer codes handling the formatting requirements.

## APPENDING AND EXCERPTING

Two or more files also can be joined into a single file using the APPEND function. A separate program, EXERPT, allows you to join — in RAM, in a new disk file, on screen or on paper — selected portions of different files. These

functions can be used on BASIC files only if they have been saved in ASCII form.

One of the more interesting functions is STORE, which creates a new RAM file called DBFI.DO. This file contains the names of as many files as you wish to store and is accessed by other BuddySystems programs, such as EXERPT and BYTCNT (which counts the number of bytes in a specified file or group of files). The program searches the disk for the files identified in DBFI.DO and performs the appropriate task using those files.

A third way to run a BASIC file — even one saved in TEXT format — is to use the Function key 4 — RUN. If you attempt to use this key on a non-program file, it will generate an error message after attempting to load the file to BASIC.

Other main menu function keys enable the user to rename or kill a file on disk, change drives and exit to the main Model 100 menu.

In addition to serving as a toggle between the CRT and LCD, the ESC key can be used to terminate any load or copy function. It also will return you to the top of the program if pressed after receipt of an input/output error prompt.

While a DVI must be linked to the Model 100 and activated for most of the programs in this package, RAM-Pal operates nicely without it. The RAM-Pal menu offers options of saving a specified file or (with the wide cursor over BASIC) all RAM files to either of two disk drives

(continued on page 51)

# Hello Rangoon

*Not only can your portable communicate over telephone lines but airwaves as well. Here's a program that would even make Samuel Morse proud.*

*By Louis C. Graue*

**T**he Model 100 is a fantastic appliance for the ham radio shack. It takes up less space than a notebook yet can do almost anything a ham operator would ask of a full size computer. Programs for operating CW or RTTY, keeping a log, calculating antenna designs or filter circuits, or anything you do frequently with a computer can all be stored in memory. The names of your programs appear on the screen when you turn on the computer and can be put into operation by the press of a key.

*(continued on page 54)*



**SUPER ROM**  
**Lucid Spreadsheet Write ROM Database Outliner**



NOW  
 AVAILABLE  
 ON  
 M-200

**NOW YOU CAN REALLY HAVE IT ALL!**

**All on one ROM. Truly the finest four programs  
 available for the Model 100 — guaranteed.  
 Try it for 30 days. If you aren't blown away by the  
 excellence return it for a full refund.**

**\$199<sup>95</sup>**

The four best programs for the Model 100 all on one ROM. 32K of power without using any RAM for program storage. This is the PCSG Snap-In ROM that just presses easily into the little ROM socket in the compartment on the back. You access the four right from the main menu like built-ins.

**Write ROM** — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit ... sur-

passed our highest expectations for quality and clarity."

**Lucid Spreadsheet:** This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

**Database:** This is a relational data base like no other. You can do everything from mailing lists to invoices. No complicated pseudo-coding, you create input screens as simply as typing into TEXT. You are not limited by size; you can have as large an input screen as you wish. Prints out reports or forms, getting information from as many files as

you like. Complete math between fields. Total interface with Lucid worksheets.

**Outliner:** Does everything that Think-tank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

Present Lucid and Write ROM owners can upgrade for \$100. If you have both it's \$75.

As usual PCSG sells the Super ROM on a thirty day guarantee. If for any reason you are not satisfied, simply return it for a full refund.

We are excited about this product. Super ROM gives the Model 100 the true power of a desktop. No other multi-program ROM has software that compares. But don't take our word for it. We invite you to make that comparison yourself. Priced at \$199.95 on Snap-In ROM.

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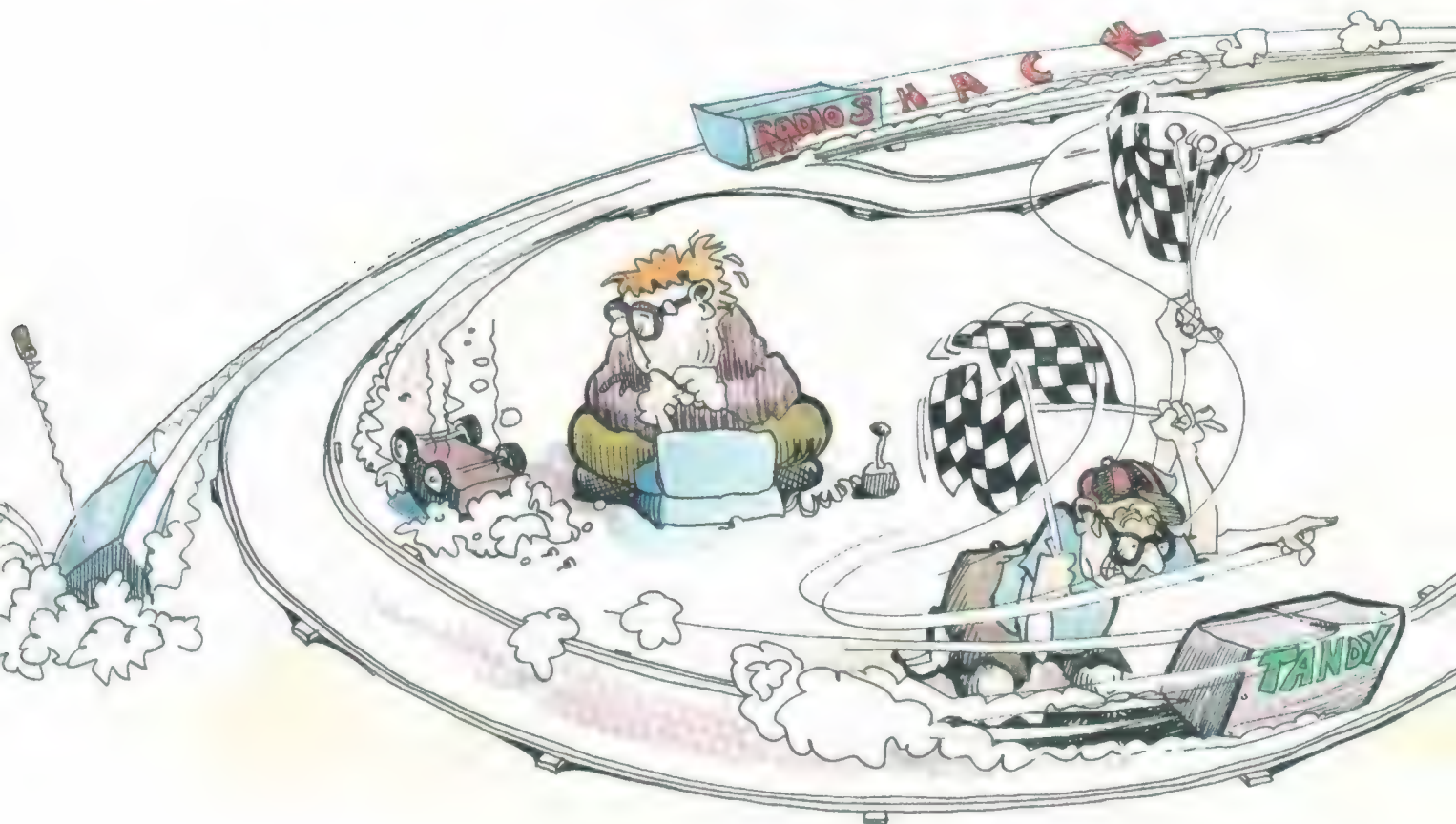
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# TANDY ENTERS THE FRAY



**Their first attempt at a disk drive was disastrous. This time around they've made amends. Although not world class, it's on the road to being a major player.**

**By Park M. Morrison**



ILLUSTRATION BY DOUGLAS COFFIN

**I**t's here. Tandy's entry in the portable disk drive Grand Prix. It's no Ferrari or Maserati but then, it's no Gremlin either.

And that's good news. We've been waiting for it for a long time. Tandy's first attempt at providing a disk drive for the portable market was the unheralded Disk/Video Interface (DVI). Big, slow and expensive, the DVI really had no place in the world of portables.

Not so the Tandy Portable Disk Drive. It's compact, easy to use, and at \$199 epitomizes the laptop philosophy.

#### PORTABILITY: THE NAME OF THE GAME

Tandy learned some valuable lessons from the DVI. For one, if it's bigger than a breadbox, it's not something people are going to want to lug around in a briefcase. That is of course, if there is a briefcase big enough to carry it.

Well, on that score, Tandy has made amends. Their new portable disk drive (PDD) is all of 6.13 inches long by 4.63 inches wide by 2 inches high. Weighing in at 1.75 pounds, all told, it's smaller than

its two major competitors: Portable Computer Support Group's (PCSG) Chipmunk and the PIC Disk from Personal Integrated Computers.

Of course, size alone does not a good disk drive make. Design features help and in that respect, the PDD has the right stuff — a low-battery light, an easy to use disk-eject bar, accessible power switch and clearly visible access indicator light. The ejection button is stiff, so use care when ejecting a disk, to avoid pushing the drive off the table.

But functionality is really all-important and in that context, the PDD performs well, although it's limited as to what it can do.

#### GETTING IT TOGETHER

The entire PDD package consists of the disk drive, manual, system diskette and cable. The PDD doesn't look complicated to hook up and it's not.

As with any new toy, batteries aren't included. The PDD requires four AA size batteries. However, it may also be run off an AC adaptor. Battery life is estimated at a minimum of two hours during continuous read/write operation and at least 10 during wait-only.

The disk drive connects to your computer via the

A man in a dark suit and tie is holding a large, oversized 5.25-inch floppy disk in his right hand. He is standing in front of a rack of server units on the left. The background is dark and out of focus.

# TAKE YOUR PICK.



ACTUAL SIZE

# RADIO SHACK'S NEW 100K PORTABLE DISK DRIVE CLEARS UP YOUR CASSETTE CLUTTER



## MEET THE NEW STORAGE SOLUTION

If you're like most Model 100 or Tandy 200 owners, you've probably found more uses for your portable computer than you ever imagined. This is great, but it brings up the question of storage. Where do you keep all those great programs you write? All that important data?

Until today it's probably been on cassettes—a lot of cassettes. And cassettes are cumbersome, bulky and, well . . . slow. Now there's a better way.

Our new Portable Disk Drive (26-3808, \$199.95) gives you fast access to 100,000 characters on 3 1/2" micro floppy diskettes.

## A TRULY PORTABLE DISK SYSTEM

The Portable Disk Drive weighs just 1 3/4 pounds, measures only 2 x 4 15/16 x 6 1/8", and runs on batteries or optional AC adapter. It's small enough to fit into a briefcase along with your Model 100 or Tandy 200. Now you can have a full-fledged disk system wherever you go. Initialization software included.

It's perfect for use with your portable's built-in software. Now you can store and update large documents with TEXT word processing and keep easy-to-store micro disks filed and categorized as you need them.

Or, if you have the Tandy 200 with built-in Multiplan spreadsheet analysis (or the Multiplan ROM pack for the Model 100), it's easy to keep many different spreadsheets on diskette. They're available for comparison and update at any time.

## REAL DISK DRIVE POWER

The Portable Disk Drive features easy menu-driven operation. The operating system lets you list the files on the diskette, and features FORMAT, SAVE, LOAD, KILL and RENAME functions. A disk access lamp lets you know that the disk is in use. Another indicator tells you when batteries are low. If they are, the unit will not function, but will finish a job in progress.

## SPEED, SIMPLICITY, FLEXIBILITY

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## DISK DRIVE

RS-232 port. The cable has a 25 pin connector (DB-25) on one end and an eight pin plug on the other. Since the connectors are uniquely shaped and the ports clearly marked, there's no chance of connecting them incorrectly. In addition, they're rugged and should take the constant plugging and unplugging associated with a portable on the move.

Underneath the drive, there's a little compartment that contains a bank of four DIP switches. Nowhere in the manual does it say exactly what these do except that they all must be on to load the file management software — and they all must be off to run it. Tandy may have thrown them in to add some mild complexity to an otherwise simple installation procedure.

Thus, hardware installation involves little more than connecting the RS-232 cable between the two devices (and the AC adaptor if desired). Not intellectually taxing. And the software installation is no more difficult.

### DO IT WITH YOUR EYES CLOSED

The system diskette contains file management programs that operate the disk drive. These must be loaded and re-

### Tandy Portable Disk Drive Specifications

Size (inches)	6.13 x 4.63 x 2
Weight	1.75 lbs.
Disk Size	3.5 inch
Disk Capacity	101.12K
Battery Life	2 hours
Transfer Rate	19,200 bits/sec.

main resident in the laptop's random access memory (RAM).

The procedure to do this requires a three line program that can either be written in TEXT and then run from BASIC or simply entered and run directly.

Loading takes a grand total of 20 seconds. While the load is taking place, a message informs you of its progress. When it's complete, you're returned to the main menu.

The only addition to the menu is a file called FLOPPY.CO. It takes up 3423 bytes of valuable RAM. However, since it provides access to a far larger storage area, its size is of minimal consequence.

And that's all there is. Hardware and software installation takes all of about 15 minutes, if that. There's little chance for error except, perhaps, when keying in the load program. You also need to be

sure there's enough free memory (about 8K of RAM) to run it.

### SO WHAT'S IT DO?

Once loaded, operating the file management software is in keeping with the Tandy tradition. That is, it requires using little more than function keys.

To bring up the Disk File Manager you need only put the cursor over FLOPPY.CO and press Enter. The menu that appears is similar to a label line in TEXT. Each function key is assigned a particular disk operation.

The menu display has a couple of nice features. One is a clock in the upper right corner which displays the same time shown on the main menu. The purpose for it is unclear, but it's a nice touch.

*(continued on page 46)*



*The Tandy Portable Disk Drive is compact and provides 100K of storage on 3.5 inch disks. It's a good yet more expensive alternative to cassette backup.*

# 6 ROM

# BANK

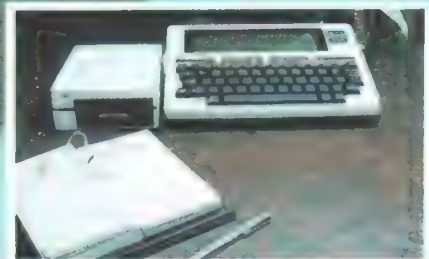
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Now you can access LUCID, DISK +, WRITE ROM, RAM + and others instantly.

The 6 ROM BANK plus battery pack lets you have the ultimate Model 100 system. When you get your unit just press in up to 6 ROMS into the sockets then push in a simple plug into your Model 100's ROM socket. The ROM bank has two posts on either end that insert into the two little holes on the underside of your Model 100.

The ROM bank props up the Model 100 at the same angle and height as those little legs you've seen. The ROM BANK itself is only about 1½" deep and it runs the width of your Model 100. It only weighs one pound. It not only installs instantly, but it pops free in a second if you need everything to lie flat in a briefcase.

Change from ROM to ROM with the touch of a thumb switch.

You can go from LUCID to WRITE to DISK+ to any other ROMS just by turning the thumb switch at the side of the ROM bank. The 6 ROM BANK is a sturdy well built construction that looks like it is a part of your Model 100.

What is also fantastic is that the ROM bank has a powerful NICAD battery and recharger built right in. This power source supplies up to 30 hours of life to your Model 100 with just 6 hours of recharge. What's nice is that it recharges right from your Model 100's power adapter. This is a quick charge system and if you need power in a hurry, you can get 6 hours of life for your Model 100 by just charging for an hour and half.

Suddenly, the Model 100 is a very powerful computer.

If you have the HOLMES portable disk drive with its powerful bundled database software package or the CRYPTRONICS 128K RAM expansion along with LUCID, WRITE ROM and DISK+ in the 6 ROM bank with its rapid rechargeable NICAD power source, you have the ultimate portable system. It's all available only from PCSG.

As usual we don't want you to take our word for it. The 6 ROM BANK is sold on a 30 day trial. If you are not satisfied simply return within thirty days for a full refund. MC, VISA, AM. EX. or C.O.D.

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# PROGRAMMING FOR SUCCESS

Computers are part of the youth rehabilitation program at Oregon's MacLaren School. Troubled teenagers with a history of delinquency and criminal activity are using Radio Shack TRS-80 Model 4 computers to "program for success."

Most of the 450 youngsters in the rehabilitation program are in need of general skills and have low self-esteem, according to program manager Rick Hill. Working with computers gives the teenagers new skills and self-confidence.

Teens are less likely to rebel against the computer than against an adult, said Dennis Ball, one of the school's counsellors. Experience with the machines teaches patience, supplies academic basics and provides new skills that are marketable in society.

The rehabilitation program currently uses 14 Model 4 computers donated by the Ray Foundation. The computers were selected because of Tandy's free teacher training and reliable customer support, Hill said.

If the pilot program in Oregon succeeds in assisting trouble youth in building more constructive lives, the Ray Foundation is planning to sponsor similar programs throughout the country.

## New Tandy Customer Support

Tandy Corp. is bucking the tide by changing its computer customer support services — for the better.

Only months after Hewlett-Packard, like many other companies, replaced its free legendary HP-COACH service with a \$45-per-call HP Helpline, Tandy has introduced its ATSO Program: Area Training and Support Operation.

ATSO provides regional customer support which far exceeds the level that individual computer centers were capable of. Under the old system, each store CSR (Customer Service Represen-

tative) was expected to be an expert in all Tandy computer products. The CSR had to be familiar with Model I TRS-DOS, Tandy 6000 XENIX, and the invisible Model 100 operating system. The same CSR also had to answer in-depth questions about Scripsit 100, Lotus 1-2-3 and the Model 4 accounting software.

Under ATSO, several support specialists work under the same roof. One specialist may concentrate on XENIX products; another may be an expert on across-the-board word processing.

Tandy established 63 ATSO centers, each in a major metropolitan area. The number and makeup of the support teams vary, but all areas should benefit under the new support program. Locations outside of these 63 ATSO centers will continue to have computer center CSR support, as in the past.

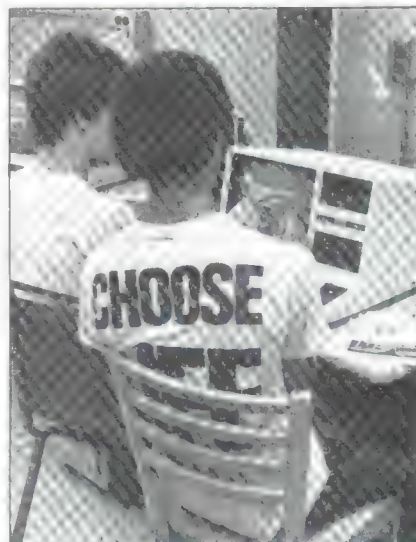
Along with ATSO, Tandy is offering several new services under its On-Site Customer Service system, providing enhanced store-based and on-site training and varying per-hour rates.

## Professional Portables

Who uses portable personal computers in Big Business? Professional and individual users, according to the Newton-Evans Research Company (NERC).

The 300-page 1985 report, entitled "Microcomputer Usage Trends in 'Fortune' Corporations," indicated that 59 percent of portable-computer users were professionals. Thirty percent of the users were managers and executives. Only 11 percent of Fortune-owned portable computers were used by clerical staff.

These statistics are significantly different than those for desktop personal computers. Fifty percent of desktop computers in large corporations are used by professionals, and 32 percent are used by clerical staff. Managers and executives comprise only 18 percent of the



*Oregon teens held at the state-run MacLaren School program for success on Tandy Model 4 computers to catch up on missed schoolwork and learn programming skills that will help them once they're released.*

user base.

The 300-page report is priced at \$750, and is available from Newton-Evans Research Company, 10176 Baltimore National Pike No. 204, Ellicott City, MD, 21043, (301) 465-7316.

## Plastic Displays

Polaroid Corp. has introduced a new, flexible plastic liquid crystal display (LCD) material. The shatter-resistant material is ideal for portable computer use.

Weighing only two ounces per square foot, the plastic LCD is one-tenth the weight of glass displays. It is also about one-tenth the thickness, measuring only 0.015 inch.

The flexible material can be curved to a radius of two inches, and can support pixel sizes as small as 0.010 inch. Shipment of the new plastic LCDs is expected in early 1986. □

# GPIB



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## GIGO (from page 7)

is overseen by the Securities and Exchange Commission. There is another name for advocating raising venture capital by the means you propose. That name is fraud. In the case you propose, specifically, mail fraud.

Richard Soltes  
Dallas, TX

*We know of no current advertisers who cash checks or charge credit card accounts before a product is shipped. — Ed.*

Regarding the editorial in your August issue, there is another alternative to advertising and promoting a product that only exists in the mind of the developer. That is advising potential customers that the product will be available at some future date and orders will be filled after that date.

I was recently "vaporized" by ads in your magazine about Write ROM by Portable Computer Support Group (PCSG). I sent in my money as soon as the ad broke. Six weeks later, I called PCSG and was told there had been a delay at the printer and they would be shipping in the next two weeks.

I waited four weeks and called again. I was told they were shipping and should have the program "soon." Another two weeks, another call and I was told, "Well, we haven't cashed your check yet."

That is all very nice and may clear their conscience that they have not misled anybody, but had I known Write ROM wasn't available, I'd have ordered Lucid which *was* available immediately. It had been my intention to order both programs but I wanted to try one before ordering the second. As a result of the "vapor-talk" from PCSG, I am disinclined to deal with them again. They have lost their credibility with me. That is a very fragile commodity, easily lost, very difficult to regain.

An ad proposing a realistic shipping date and soliciting pre-release orders would have enabled them to test the marketing waters while maintaining their credibility.

I hope the industry will read your commentary and heed this letter and act with some responsibility.

C. E. Voigtsberger Jr.  
Ventura, CA

*PCSG admits they had production problems with Write ROM. When they booked advertising for the product in the March issue of Portable 100/200, we are told, they fully expected to be shipping by that time. Due to a variety of rea-*

*sons, they did not begin shipping until May. They have been shipping steadily since then. — Ed.*

I was appalled to read your Machiavellian column "The Waiting ROM" in the August, 1985 issue of your magazine. One can only assume that the bulk of your revenues derives from advertising and that, as a result, you are willing to participate in misleading your subscribers under the banner of furthering the growth of the industry.

I am pleased portables have been developed, but if such development can only occur in the context of widespread deception, I would just as soon live without them.

The only good news in your editorial is that magazine publishers are being held liable for fraudulent advertising in their publications. Because the computer industry is young or very important or whatever does not mean its promoters should be held to different standards than the rest of us.

I frequently order items on the basis of advertisements in your magazine. You can be quite sure that the first time I encounter the difficulties you mention I will file complaints with the U.S. Postal Inspector's Office, the Maine Attorney General, your trade association, and any place else I can think of at the time. If you choose to embrace the moral principles of profiteers, linking yourself to dishonesty as "industry advocates" who have to "fuel the entrepreneurial effort," then you should reasonably share the penalties our society wisely deals out to those who hold themselves above common decency and the law in the name of a so-called greater good.

Daryl B. Matthews, M.D.  
Lihue, HI

## LAPWORD HINTS

I think Lapword is the best text formatter for the NEC. The only problem I have is using it with XFILES.CO. It'll garbage everything up unless you first hide it with READY.BA (which is included with Lapword). However, if you have a printer code file such as EPSON.CO and accidentally run it while Lapword is in the SAFE mode, then it'll crash that bank and necessitate a cold start.

What I've been doing is using MEM-MGR.BA from Traveling Software to make EPSON.CO invisible. I then make Lapword "SAFE" which renames it L—.CO. Next I use the system menu to rename it as Lapword. Finally, I kill

SAFE.BA and, in Basic, clear 100,-7552. Now when I access Lapword, it uses the codes from EPSON.CO — no more crashes, no more cold starts.

John J. Gaudreault  
Omaha, NE

### LOOKING FOR HELP

I am currently doing a literature search on immunosuppression and its relationship to new malaria vaccines. I am collecting and abstracting data at the National Medical Library using my Tandy 200. Books cannot be taken out of the library so I do all the reading and abstracting there.

At home, I use an Apple II Plus and manually input the data from my Tandy 200 into a dBase II format. The process is very tedious since I don't know how to transfer the data directly from the 200 to the data base on my Apple

I am sure there is a more efficient way to do this. Can you help?

Kay A. Buck  
McLean, VA

*One can connect a Tandy 200 to an Apple II Plus and, with a little tinkering, dump data to the Apple, convert it and load it into a data base, however, it is not recommended practice for immunosuppression researchers.*

*We'd suggest asking your local Radio Shack and Apple salespeople if they know of any software packages that might facilitate the process. Or you might consider using a database manager such as T-Base from Traveling Software and just use the 200 exclusively. — Ed.*

### FOOD FOR THOUGHT

About 10 months ago I became the proud owner of a Model 100 at which time I first heard of your magazine. Being the owner of another popular TRS-80 computer, the Color Computer, and having visions of all the good publications for the machine, I eagerly subscribed to *Portable 100/200*.

The first few months had a fair amount of programs to get me started. Each month thereafter your ads became repetitious, programs became scarce — many months had none at all. As if the multipage ads are not enough, you write reviews to fill the space that might contain an occasional listing. A publication so inclined to serve only its advertisers is usually called a catalog and is sent unsolicited and free of charge.

If by chance you find it in your power to cater to the Model 100 owners with some meat instead of scraps then I'd feel

compelled to praise you as I now find fault.

It's a shame as the only other alternative is large phone bills and larger CompuServe bills to acquire listings.

Donald J. Briggs  
Syracuse, NY

P.S. If you have the intestinal fortitude to print this letter, I'll eat each and every page in said issue that contains a useful program listing. I'll even do it in Camden, if you desire, on my next trip to Maine.

*We've had similar letters from other readers and that's why we started Portable Program Review (PPR), a monthly newsletter providing a wealth of listings for our program-starved patrons. Portable 100/200 will increasingly include useful programs, but before giving up on us, you should give PPR a try. Besides, it might taste better. — Ed.*

### WRITE ROM REVIEW REVIEWED

About your Write ROM evaluation. Most I got was a critique of the manual with little to show someone really got into using the program. It was too general and did not really tell me why it is a good buy.

I used Write ROM for a month's trial and found the program excellent and the customer service the same — but it was just not cost effective for my needs. My TP100 does just as well at a third the price.

Arthur H. Sanfelici  
Frederick, MD 21701

### BUSINESS UTILITY SOFTWARE, WHERE ARE YOU?

I attempted to contact Business Utility Software to purchase their C compiler for the Model 100. The telephone number is answered by a recording with the usual "check your number and redial" message.

I would like to purchase the product (assuming it works). Could you provide additional information on the competence of the product and where it can be purchased?

Bennett D. Shulman  
Lansing, MI 48915

*We, too, were unable to track down Business Utility Software despite calls to the Better Business Bureau, California Board of Equalization, Secretary of State's Office and San Francisco's City Hall. We suggest you wait for someone else to come out with a C compiler.*

(continued on page 68)



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# Conserving Precious Memory

*Machine language programs often take up more room than is necessary. Understanding how they are stored can help reclaim otherwise wasted space.*

By Jim Irwin

**A**re you confused about machine language program storage? If so, you aren't alone. But why should you care? Because you may be wasting a significant chunk of memory without even realizing it!

The portable computer family (Model 100 and Tandy 200, NEC 8201) manages machine language programs in a form different than BASIC or TEXT files. By understanding what computers do with machine language files you'll be able to maximize the use of your portable's memory.

BASIC and TEXT files are simple to understand. What you see is what you get. You are working on the file "in place" — the changes you make are entered directly into the file itself.

Machine language files are different. They can (and often do) reside in two

places in your computer's memory. The result is a memory penalty equal to the length of the machine language program. Knowing this can help you avoid the memory penalty and perhaps recover several thousand "wasted" bytes.

To help understand where programs are stored, refer to the simple memory map in the table below.

User random access memory (RAM) is further divided as follows:

TOP: Space reserved by CLEAR command  
String Variables  
Available RAM  
Numeric Variables  
PASTE Buffer  
.CO (Machine Language) Storage  
TEXT File Storage  
BOTTOM: BASIC Program Storage

Essentially your programs and files grow upward in memory while your reserved space and string variables work from the top (MAXRAM) down.

A machine language program can be stored anywhere in user RAM. But to execute the program, it must be loaded at a specific address range. The address range required is determined by the person doing the machine language programming.

Most machine language programs are designed to run at the top of user RAM in the space reserved by the clear command. A typical example may be CLEAR 50,60000. This command "reserves" the area between 60000 and MAXRAM for your use. The computer has no idea of what you are going to put there nor does it care. It just knows that the space from 60000-MAXRAM is *not* to be touched. In fact, CLEAR is available specifically for the purpose of reserving space for machine language programs.

This identifies one area where machine language programs are stored — the area saved by using CLEAR. The other place where machine language programs are stored is shown in the memory map. It's the space between TEXT files and the PASTE buffer. Fortunately, no space is reserved there until you request it. To do this for the

(continued on page 53)

*Memory map showing where programs are stored*

## ADDRESS RANGE CONTENTS

MAXRAM-65535	Reserved for Computer's Use
32768-MAXRAM	User RAM (32K Machine)
40960-MAXRAM	User RAM (24K Machine)
49152-MAXRAM	User RAM (16K Machine)
57344-MAXRAM	User RAM ( 8K Machine)
0-32767	ROM Programming (BASIC, TEXT, TELCOM, etc.)

MAXRAM = 62960 Model 100  
62336 NEC 8201  
61104 Tandy 200

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## SOFTWARE LIMITATIONS: DARK CLOUDS AND SILVER LININGS

The most troubling inadequacy of Tandy's new drive isn't the drive itself, but its sequential-access operating system. The software limits the drive's usefulness to that of a high-speed cassette instead of providing the full random-access functionality associated with most microcomputer disk drives.

The distinction is more than academic. It has immediate and important consequences for buyers.

### LIMITATIONS AND CONSEQUENCES

Say you've written or purchased a program that maintains a 100-name mailing list for your business. The mailing list is stored alphabetically in a database that contains 100 records — one for each person on the list. Each record contains a number of fields: name, street address, city, state and so on.



Suppose now that you want to view, change or print the address of one of the people on the mailing list — *John Smith*. It's here that the Tandy drive's unwieldy operating system begins to present obstacles.

Most disk operating systems allow the computer to calculate the physical location of John Smith's record, position the drive's read/write heads at that location and read the record into memory for sub-

sequent display, modification, printing or whatever. If the user chooses to modify the information, the software writes the new data onto the disk in precisely the same location.

With Tandy's portable disk drive, the user must load the *entire* 100-record database into random-access memory (RAM) before the mailing list program can find the desired information. If modifications are made, the user must transfer the entire file back onto the diskette.

As you might imagine, this is quite a time-consuming process, particularly since the drive requires about two seconds to start the motor spinning and position the read/write heads, and then transfers data at just 19,200 bits per second. (This slowness is in turn attributable to another incomprehensible aspect of the drive's design: It connects to the computer via the RS-232 serial port in-

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stead of at the system bus located under the panel on the bottom of the computer.)

This requirement that the Model 100 or Tandy 200 load the entire file into RAM entails a second important functionality tradeoff. It limits file size to the maximum that will fit into the computer's RAM.

Let's use our hypothetical 100-record mailing list as an example. Suppose your portable computer has made your business so successful that you now have 1,000 names to enter. There's probably room for them all on the disk. But the Model 100 is limited to 32 kilobytes (K) of contiguous memory and the Tandy 200 has just 24K. Despite the drive's 100K capacity, it's impossible to work with the mailing list.

It gets worse. The original 100-record database is probably about 10K long. You store the database on a floppy disk, delete it from RAM, and write a memo or two with TEXT. Then you go to retrieve the mailing list and receive an error message. Why? The new memos have left you with less than 10K of free RAM space. Tandy's manual for the portable disk drive says this isn't a problem, that

you can just go into BASIC and KILL some of the data files. (It's probably a better idea to store them on one of the extra formatted disks you keep around for emergencies like these.) In either case, the manual is wrong. It is a problem.

IN SEARCH OF SILVER LININGS

Given its low price, battery-powered operation and convenient portability, Tandy's portable disk drive is likely to find a wide audience. It should: The price/performance ratio is agreeable and the drive is far superior to the slow, awkward cassette drives it is intended to replace. Its 100K capacity, though unimpressive in light of the 360K drives available from Portable Computer Support Group and Personal Integrated Computers, is sufficient for most of the tasks you'd choose to perform with a 32K portable computer.

The main obstacle is the operating system, which limits the unit's uses to the same tasks you'd perform with a cassette drive.

It's the operating system, too, that has the greatest potential for change.

Tandy's portable disk drive isn't inherently less flexible than other drives. It's perfectly capable of performing random-access read and write operations under software control. A new operating system written in BASIC or machine language could do much to remediate the drive's limitations.

Such a project is underway. Portable 100/200 is sponsoring the development of a new operating system that will add complete disk drive control to all of Tandy's portables. Reader suggestions will be translated into software features. Portable 100/200 will solicit improvements from the reader community. The bare-bones code will be published in the magazine, followed by a complete listing of the final implementation. A new standard will be available for software and data distribution. The operating system will be contributed to the public domain and distributed to readers via 3.5-inch diskette.

With the assistance of the user community, Tandy's portable disk drive can have an important influence in the continuing evolution of portable computer applications.

— J. D. Hildebrand

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**DISK DRIVE**

The other is a running count of the number of bytes free in RAM. This is important when loading several files from diskette or making a disk backup. Although the file manager won't permit you to load files larger than free RAM, it's nice to know what you have to work with when copying several files.

There are eight commands available on the Disk File Manager, one for each function key. They are listed on the menu as follows:

F1: Files	F2: Load
F3: Save	F4: Bkup
F5: Kill	F6: Name
F7: Format	F8: Menu

The Files command gives a directory listing of the files on the current diskette. Files are listed alphabetically (left to right) in two columns. File size is also listed as well as the amount of bytes free on the disk.

Depending on your computer (Model 100 or Tandy 200), either 12 or 28 files will be displayed. If there are more, hitting any key will show the rest. The next key you hit returns you to the menu.

There is a limit of 40 files that can be put on a diskette. Under normal circumstances this wouldn't cause any undo hardship. However, given that each diskette has a capacity of 101.12K bytes, it's conceivable you could reach the file limit and leave a lot of unused disk. In essence, wasted space.

The Load command, as it implies, loads files from disk to RAM. It's a very simple procedure. Type in the name of the file you want to load and what it will be called on RAM, press Enter and over it goes.

The PDD's data transfer rate is 19,200 bits per second. To the computer layman that may seem fast but in actuality it doesn't break any speed records.

**ONE AT A TIME**

One of the drawbacks to the load program, and indeed to a few others to be mentioned, is the inability to work on more than one file at a time. When loading is complete you're told to hit any key. This returns you to the file management menu where, if you want to load another file, you have to access the load command again.

Of equal obnoxiousness is being bounced back to the menu if you mistype the name of the file you want to load from disk. For example, if you misspell its name or leave off the extension, you'll be told the file wasn't found and the next key you hit will put you back at

## DISK DRIVE

the starting gate.

Obviously these are more nuisance features than flaws. But it would be more purposeful and quicker if you could finish what you set out to do without having to start all over again.

The Save command works the same as Load, but in reverse. Again, you're asked to enter the file name on RAM and what it will be called on disk, hit Enter and away she goes. For what it's worth, it took 14 seconds to save a 5K byte file. That time increased by a few seconds depending on how full the diskette was.

Again, all the features of Load, good and bad, hold true for Save.

Bkup allows you to copy the contents of one disk and put them on another. Essentially, instead of loading files from disk and then saving them to a new one — one at a time — this command lessens the monotony by doing all of it for you. Except of course, swapping diskettes.

How long this procedure takes is directly proportional to how much space is available on RAM. If you have a full disk and only 5K free on RAM it's going to take about double the time (and twice as many disk changes) as if you had 10K free.

The Kill command erases a file name from diskette so the file can no longer be accessed. It's similar to the Kill command on the main menu of the Tandy 200. You're given the option to kill or not to kill — if you opt for yes, it's gone for good.

Name is a command that allows you to rename files. It prompts you for the old file name and then the new. If you use a file name that already exists, you'll be informed. Unfortunately, it doesn't give you the option of selecting another name. Instead, it takes you back out to the menu.

Format is self explanatory. It formats a diskette. Since everything on the diskette is wiped out during the process, you're told if the disk contains data and asked if you want to continue. It's a nice safety feature.

If you decide to go ahead and format, it'll take about 100 seconds which, again, doesn't break any speed records.

The last command is Menu, which returns you to the main system menu.

### THAT'S A MANUAL?

Doesn't the word manual spark visions of a looseleaf or ring binder so big that if dropped on your toe, you'd be laid up for weeks? Wordy writing and poor editing aside, manuals are typically verbose — overflowing with trite and trivial ramblings about a product's importance to society. Mixed in, of

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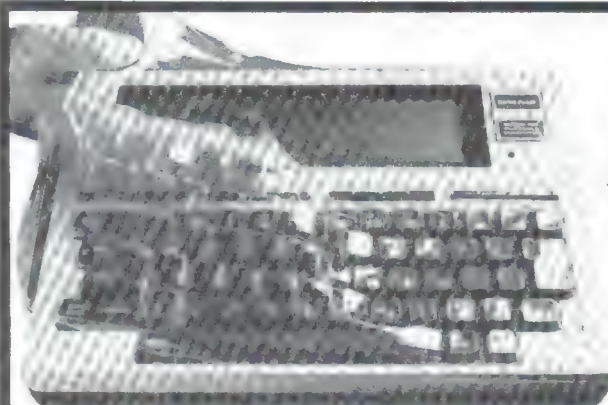
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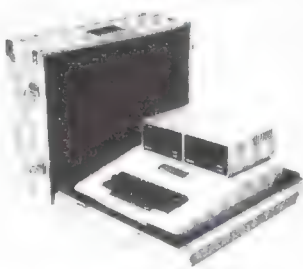
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## DISK DRIVE

course, are directions on how to operate the bloody thing.

Tandy's manual for the portable disk drive in no way fits this mold. It's a 26 page softcover pamphlet. Regardless of the simplicity of the product, manuals less than 30 pages tend to be on the vague side. This one is no exception.

It seems that Tandy assumes a PDD user is familiar with computers and has used a disk drive before. There'll still be unfortunate novices who'll get left in the lurch. Explaining how it works just isn't enough — tell *why* it works or what you can use it for.

Despite these philosophical criticisms, the manual is clear and concise — for what it has to say. It does provide operating instructions on how to avoid machine language conflicts with FLOPPY.CO, a description of error messages and the PDD schematic.

## CASSETTE DEJA VU

To fully evaluate Tandy's portable disk drive one should put it in a proper perspective. Was it developed to compete with Chipmunk and the PIC Disk or to replace the antiquated cassette player? After using it, it's readily apparent the latter is true.

The PDD really does nothing more than a cassette backup. It does it faster, better and easier but that's not the point. Tandy has just reinvented the wheel (with minor improvements). For what it does, is it really worth the extra cost over cassette? That certainly has to be considered by the potential buyer.

But say you're sold on diskette drives. You're sick and tired of battling with cassettes. Then how does it compare to others on the market?

Well, it loses in speed, storage and functionality tests. Other disk drives store more data per diskette and have some pretty sophisticated operating system software that increases the drive's usefulness. For example, other units provide random access of data files and the ability to run programs from disk. But the PDD either wins or comes in a close second on price, portability and ease of use. So it all depends on what you want to use it for.

If you want a simple backup device, then look into the portable disk drive. But if you need something to increase the capabilities of your portable, the PDD is going to fall short.

It's a good start but there's room for improvement. □

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## REVIEWS (from page 31)

(including Chipmunk — more on that later) or to cassette. RAM-Pal's function keys also enable you to run a program, rename or kill a file, or append one file to another.

Changing the operation of various function keys has been reduced to its simplest form with SETKEY.BUD. The program prints out the current key settings and asks which key you wish to change. You then type in the appropriate commands, up to 15 characters, such as *KILL* " or *RUN* "Type+.BA."

For commands like the latter, SETKEY asks if you want to terminate the assigned string with Enter.

Since most users no doubt have a variety of function key formats for various purposes, another program, KEEZ.-BUD, allows you to save as many sets as you want, each with an identifying extension, such as KEEZ.WRT, KEEZ.TYP and KEEZ.DVI. KEEZ.BUD resets all function keys to default, but adds EDIT and CLS to the normally unused F6 and F7 keys.

One final program tossed in with a certain degree of tongue-in-cheek is TIMER.BUD, which the manual describes as good for darkrooms, boiling eggs and timing game moves. Basically, it turns the Model 100 screen into a countdown timer, sounding an attention-getting tone on reaching zero.

### THE BOTTOM LINE

Perhaps the most disappointing thing about Disk-Buddy is that it is incompatible with the Chipmunk portable disk drive from Holmes Engineering/PCSG.

There are — or no doubt soon will be — far more Chipmunks out there than DVIs, but the Chip just won't read the D-B programming. Auxiliary programs such as RAM-Pal can be used with it, though the user does not have the control over file transfers available with Chipmunk's own software.

The real winning combination would be Disk-Buddy and a low-cost monitor interface and disk drive. Someday, no doubt.

As for the here-and-now, the ads for Disk-Buddy claim it will let you "civilize the Disk/Video Interface, make savage the Model 100." Well, a bit of license is expected from advertising copywriters. What Disk-Buddy *does* do is provide control over disk files and simplify file transfers — with or without a DVI — without threatening the integrity of your original files.

As for civilizing the DVI — keep your whip and gun handy.

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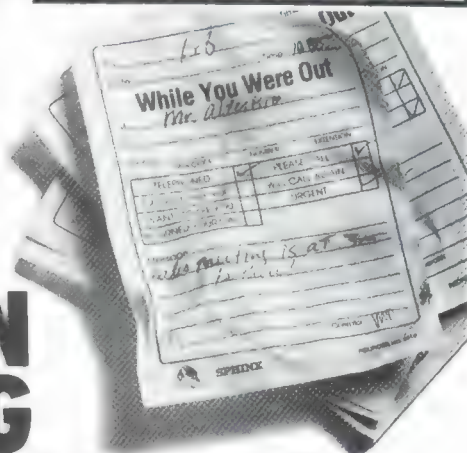
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# Order of Sorts

**Sort**  
Sorting utility  
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Circle No. 144

By CARL OPPEDAHL

**M**y book about the Model 100 had just been typeset. I needed to get index information to my publisher pronto.

The index is always the last section of a book to be completed. That's because you can't start it until the book's been laid out, so you know where each term will fall. By the time I received pages to work from, I had one day to turn it around. I needed a good sort program to help me out.

## ORDER OUT OF CHAOS

Custom Software's Sort utility is a machine language program that's fast, versatile, memory-conserving and easy

to use. It runs on the Model 100, Tandy 200 and NEC PC-8201.

From the point of view of Sort, a .DO file is composed of records, each of which has been terminated by typing the Enter key. The resulting carriage-return, line-feed sequence appears on the screen as a small triangle pointing to the left. Each record is considered to be composed of fields, each separated from adjacent fields by a separator character. You can decide for yourself what character will serve as the field separator.

When running Sort, you specify the filename, the separator character that's to be used, the field number (from one to 255) and the type of sort (ascending or descending). Most BASIC sort programs read the file to be sorted into an array, thus consuming a lot of random access memory (RAM). Sort, however, sorts the .DO file right where it sits in RAM. As a result, the .DO file can be as large as 27K.

Another nice feature of Sort is that neither the records nor their fields need be of uniform length. Some sort programs require all records be the same length, or that the sort field be at a constant column-wide location within each record.

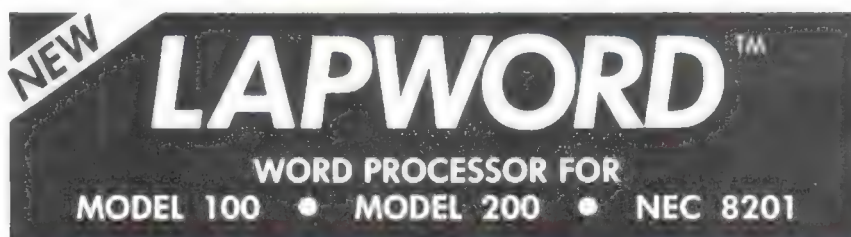
Sort is shipped on a non-copy-protected cassette. A relocating loader is provided so the Sort program can reside above or below other machine language programs. Because Sort doesn't use RAM hooks, there is no need to remember to reset them. Assuming you run it only directly from tape, or by selecting it from the main menu, you needn't have the usual machine-language worry about accidentally destroying all your files.

The six page manual properly opens with a discussion of the precautions that must be taken if Sort shares memory with other machine language programs. The section describing how to actually run the program is correct though brief. An example or two would be helpful to the new user.

After going through all the pages of my book, I ran Sort, specifying the search should be performed on the first field. It didn't matter which character I used as a field separator, but I specified a tab. The whole file sorted in just a couple of minutes. My publisher had his index in less than 24 hours.

Custom Software's Sort utility is a good, competent program. And at \$19.95, it's a bargain. □

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## MACHINE LANGUAGE (from page 44)

Model 100 and Tandy 200 use SAVEM in the form SAVEM "name", Start Address, End Address, Entry Address. For example: SAVEM "TEST", 60000, 62959, 60173.

For the NEC 8201 use: BSAVE "name", Start Address, Length, Entry Address. An example in this case would be: BSAVE "TEST", 60000, 2960, 60173.

These commands make a copy of whatever happened to be at 60000-62959 and store it between your TEXT files and the PASTE buffer. The commands *do not* clear out the area from 60000-62959. That information is still there.

You now have two copies of the same information. The copy in between TEXT and PASTE is not executable but *can* be accessed from the main menu. The copy at 60000-62959 is executable but *cannot* be accessed from the main menu. And you thought you were confused before you started reading this.

If you have saved a machine language program using the SAVEM or BSAVE command, then a .CO file will appear on your main menu. When you place the cursor over that file and press Enter, your computer will try to copy the data from the TEXT-PASTE area into

the 60000-62959 area. (Those addresses are arbitrary but correspond with the example).

If you haven't cleared that area, then your computer will beep and not load the program. So, in order to load a SAVEM or BSAVE program, you must have the necessary space reserved in user RAM. Again, this takes twice as much space as the program itself.

Every problem has a solution, and this one is no exception. The key is to leave the executable copy in the cleared space and then SAVEM or BSAVE just *one* byte. Typically, the best byte to save is the entry byte. Our previous examples would then be: SAVEM "TEST", 60173, 60173, 60173 and BSAVE "TEST", 60173, 1, 60173.

By trying this you'll find that saving one byte actually takes seven bytes. The computer uses six for overhead plus however many bytes you save. Thus, seven bytes are placed between TEXT and PASTE instead of the 2966 used previously. You just saved 2959 bytes!

There are times when you will need to save entire machine language files rather than just one byte. If you have two or more programs that compete for the same space, then at least one of them

must be saved completely while the other is in use. On the 200, Multiplan won't run unless the top of user RAM is available for it. So you can't keep a program there permanently and still use Multiplan.

The important thing to remember is that machine language programs can be stored in *two* places in your computer. If they are stored in both places, you are wasting precious bytes. You can save bytes if you follow these guidelines:

1. If a program is stored in cleared space, SAVEM or BSAVE only one byte.
2. If SAVEM or BSAVE is used to save a complete program, remember to clear your computer to MAXRAM to gain that additional storage space.

When possible, the most efficient use of space is to leave the program stored in the cleared area and save only one byte.

Memory is a precious commodity in our portable computers. By managing machine language files properly, it's possible to save thousands of otherwise wasted bytes. □

Please help us rate this article's value. If you've found it very valuable, circle 173 on the Reader Service Card. If it was moderately valuable, circle 174—and if it wasn't valuable to you, circle 175.

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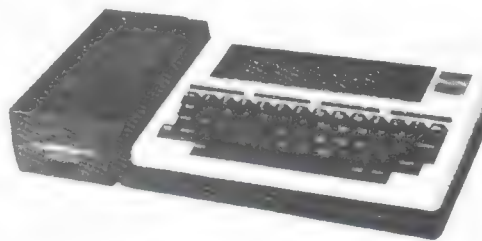
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## Common Radio Abbreviations

CW	— Continuous wave, or Morse Code
RTTY	— Radio teletype, using radio to enable machine communications
QSO	— Communication session
UTC	— Universal Coordinated Time, or Greenwich Mean Time
CQ	— General call message; sender wants to talk to anyone who replies
RST	— Signal strength: measured as three digit number indicating strength, interference and noise levels
KN	— Address station only transmit, sender awaiting reply
QTH	— Transmitter's location

It's sure a lot more convenient than having to use either a tape or disk drive. And it's battery powered so it can be used with other portable equipment.

The following program turns your Model 100 into a great CW keyboard. It'll even remember the starting and ending times of your QSO and automatically update the station log. Function keys make it possible to output most of your QSO without any typing. Other features include:

- Input and output speeds are independent so you can type well ahead of the

transmission.

- Two cursors appear on the screen. One indicating which character is being transmitted and the other for the keyboard input.
- The output speed is displayed on the label line and can be changed at any time by pressing the corresponding function key.
- The call sign of the other station need be entered only once and pressing a function key will send the ID sequence.
- Pressing a function key will call CQ for you, send your QTH, or describe your station.

- Output can be halted by pressing the Enter key. To restart at that spot, press Enter again.
- Hitting the Escape key will clear the screen, the buffer and stop output.
- The program is short and written in BASIC so it can be easily modified to fit your station.

## HAMMING IT UP

Type in the listing making the following changes:

1. Change line 660 to hold your call sign.
2. Change line 760 to hold your QTH and name.
3. Change line 900 to hold your call sign.
4. Change line 940 to hold information about your station. Keep it short.
5. Eliminate all Remark statements, if desired.

After entering the program be sure to save it in memory (i.e. SAVE "CW"). The menu will display CW>BA whenever you turn on the computer. You can run the program and check the operation, other than sound, without attaching it to a transmitter.

## Why Handle Files One at a Time? Let XOUT/XIN from BKI do the work for you.

Eliminate tedious (and fault prone) load/save/kill and format procedures on your MODEL 100. XOUT/XIN programs automatically create/read and display RAM and external directories. Resulting free space is displayed as files are selected/deselected to aid in memory management. Menus and prompts provide a safe, easy-to-use file management utility—an amazing productivity tool.

Use XOUT.BA to send multiple copies of selected memory files to the tape (Save); or send them directly (List), or via a formatter (4mat), to either the printer or the screen. Selected files can simply be removed with the Kill command and confirmation. An external directory is automatically created for each copy of a file set that is saved (containing creation date and time, and an ordered list of names and file sizes). Files saved on tape, including the directory, may also be loaded one-by-one by BASIC or TEXT, in the usual way.

Use XIN.BA to automatically Load selected tape files back into memory; or send them directly (List), or via a formatter (4mat), to the printer or the screen.

### Typical XOUT.BA Menu

```

XIN B 3994 NAMES D 401 SPRED1C 1007:
XOUT B 387: CHAP01D 1390: SPRED2C 1507:
DO4MAT B 249: CHAP02D 1853:
BA4MAT B 201: CHAP03D 1853:
LIST1 D 2: D0SS D 0:
LIST2 D 201: PRTCAPD 464:
LIST3 D 801: PASTE D 1:
2221 Free 26968 Used 29189 Total
Save List 4mat Kill Abrt Menu
    
```

### Typical XIN.BA Menu

```

XIN B 0: CHAP01D +200:
XOUT B 0: CHAP02D -249:
DO4MAT B 0: CHAP03D 1853:
BA4MAT B 0: D0SS D 0:
LIST1 D -120: PRTCAPD 0:
LIST2 D 801: PRTCAPD 1007:
LIST3 D 401: SPRED2C 1507:
NAMES D 401: SPRED2C 1507:
7510 Free 21679 Used 29189 Total
Load List 4mat Next Abrt Menu
    
```

### - XOUT.BA -

- Displays memory contents in memory address order.
- As files are highlighted memory statistics are changed to reflect values if Kill selected.
- BA files are stored on tape as standard tokenized files.

- Label line alternatives with statistics line by toggling the label key.
- Any combination of files can be highlighted by positioning the pointer and pressing space or enter. No action is taken until commanded by a function key, and then all highlighted files are affected.
- The 4mat command invokes the BA4MAT.BA program to format BA files and the DO4MAT.BA program to format DO files.

Skeleton BA4MAT.BA and DO4MAT.BA programs are provided as examples for interfacing existing formatters. Full featured BA4MAT.BA and DO4MAT.BA programs, already interfaced with the XOUT/XIN programs, are offered as separately priced items. DO4MAT.BA and BA4MAT.BA format a single file if executed from the main menu or multiple files if executed via XOUT or XIN.

### - DO4MAT.BA -

- Formats documents using embedded command descriptions for many features, including columns, underlining, bold print, filling and adjusting.
- Optional headers and footers may include the date, time and page number.
- Specify printer make and model. (Customizing directions given for printers not yet implemented.)

### - XIN.BA -

- Displays tape contents in tape position order.
- As files are highlighted memory statistics are changed to reflect values if Load selected.
- If the file name exists in both the tape and memory directories, the difference (+, -, 0) in size is shown.

### - BA4MAT.BA -

- Formats BA files so that the individual basic commands are listed one per line indented from the basic line number.
- Additional indentation occurs to diagram the IF-THEN-ELSE structures in the program.
- Pagination including the date, time and page number are provided.

XOUT.BA/XIN.BA	
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BA4MAT.BA (skeleton)	49.95
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## MORSE CODE

To explain the use of the program, let's run through a sample session. Turn on the computer, set the date and time to UTC or whatever time you want to use in the log. Place the cursor over CW.BA and press Enter.

The screen will clear and the cursor appears in the upper left corner. Press the Label key to get a display of the function keys. Notice F5 will call CQ. Press F5 and CQ message appears on the screen. The sending cursor will move across the letters as they are sent out.

Suppose WB8TLF answers. Start with a clear screen by hitting Escape. Then type "[" (open bracket). It will not appear on the screen but it initiates the saving of everything typed up to the first "space."

So type [WB8TLF and press the space bar. WB8TLF will be sent out to the transmitter and you'll see the putput cursor moving.

Next press F1 to send the ID. "WB8TLF DE K8TT" appears on the screen and is transmitted.

Follow that by hitting the F2 key. This prints "TNX FOR CALL—QTH IS BOWLING GREEN, OHIO ? BOWL-

ING GREEN, OHIO — NAME IS LOU ? LOU — YOUR RST IS 599 ? 599".

Notice that the RST report is at the end. If it is not 599 then remove any 599s and replace with the correct numbers. You'll have plenty of time before the output catches up.

Finally, press F1 again which prints WB8TLF DE K8TT. Then type KN which turns it over to the other station. The call and the starting time have been saved. Notice that very little typing is necessary for the entire first round of the QSO.

Now while the other station is talking, hit Escape to clear the screen, press Enter to stop output, hit F! to print the opening ID and type somethings you want to say on the next round. When the other station is finished hit Enter and your message will go out.

At the end of the QSO type F4 to have the station log brought up to date. The log is stored under LOG.DO and you can make changes using TEXT. Also, the search function (F1) allows you to quickly locate a call sign that's in the log. So during a QSO you can make a quick check to see if that station has logged on before.

## INTERFACE TO THE TRANSMITTER

Pin 20 of the RS-232 connector on the back of the 100 is the data terminal ready signal (DTR). Normally it is at -5 volts. It can be changed to +5 volts by the statement OUT 178,0 and back to -5 volts by OUT 178,64.

You'll notice these statements are used in the program for output. The program assumes the statement OUT 178,0 will turn on the transmitter. This information should be enough to enable you to construct the proper interface for your transmitter.

For many solid state transmitters, it's only necessary to ground the key line. Figure 1 shows a very simple circuit used to connect a Heathkit SB104 key line. It consists of a 2N2222 type NPN transistor, a 1N914 diode and two resistors. The +5 volts applied to its base allows the transistor to conduct and thus ground the key line.

## PROGRAM DETAILS

Here's a line by line discussion of some important elements of the program to help you gain some insight to

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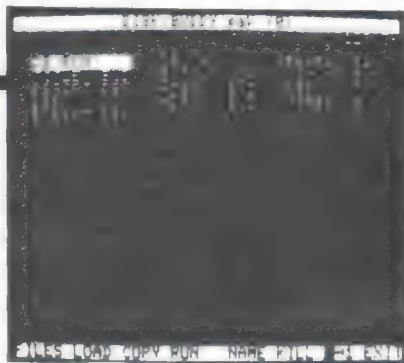
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## MORSE CODE

appropriate dot or dash subroutine. After the code for the character has been sent line 390 follows it with a character space. Line 400 replaces the output cursor with the character just sent and upgrades the output cursor location in F. Lastly, in line 410, the buffer has the front character just sent, stripped away.

## THINGS THAT GO BUMP IN THE NIGHT

No matter how carefully a program is written there will be unexpected things that can go wrong especially when some one other than the programmer is operating. Known bugs can usually be corrected by additional programming but sometimes that would make the program too complicated or take too much extra effort. Let's discuss things that can go wrong and how to avoid problems with them.

A string can only hold 255 characters. Thus, if you get carried away using the function keys and typing real fast you can exceed this limit. When this happens the program will break and give you an LS error — meaning the string BF\$ is too long. Since there are 40 characters to a line on the screen, you should take care not to have the output cursor more than six screen lines away from the input cursor.

You must exit the CW program using F8. This will reset all function keys to their default settings. If you exit the program any other way then the function keys will not work. For example, if you get an LS error as explained above and try to list the program with F5, it won't work. You'll have to type LIST. The way to correct the situation is to type RUN, hit Enter and then exit the program using F8.

When you have an error that exits the program, it may happen just as the output has been set to turn on the transmitter. The transmitter is stuck sending out a carrier. To correct this, type RUN and the program will shut down the transmitter. Otherwise, turn off the transmitter or it will blow out components if it is not rated for continuous duty.

When you have filled up all the lines on the screen, it will scroll up for the next line. This takes a lot of time and makes the code element being sent at the time too long. This means that after you reach the bottom of the screen, one character per line will go out sounding funny. One way to avoid this is to type all but the last letter on the line, then watch the output cursor until it reaches a space between words and then, at that moment, type the last letter. This means

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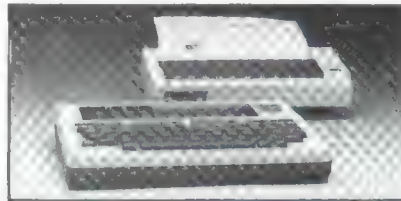
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## MORSE CODE

that the word space is a little longer and that will go unnoticed.

The label key will toggle the label line on and off. If you leave it on when you reach the bottom of the screen and force the seven lines to scroll, the screen will not reflect the right sequence. The CW output is still perfectly good, only you will have difficulty telling where you are. Just remember to turn off the label line if you are going to a seventh line.

You can still turn it on for a look without upsetting the screen.

If you start the program, the screen clears, the cursor appears in the upper left corner and you start to type but nothing happens, check the Caps Lock key. If it is not down the program won't work. It only accepts uppercase letters.

You may notice an output speed change when you type as characters are being transmitted. This is supposed to

be balanced out by the size of the delay loop in line 800. It's set at 18 but you may have to use trial and error to find a value that will remove the speed change. □

*Please help us rate this article's value. If you've found it very valuable, circle 161 on the Reader Service Card. If it was moderately valuable, circle 162—and if it wasn't valuable to you, circle 163.*

```

10 'CW keyboard with auto-log for the M-100
20 'BY K8TT (5/27/85)
30 '
35 'Initialize
40 CLEAR 600
50 SP=0
60 DIM CS(50)
70 FOR I=1 TO 47
  :READ CS(I)
:NEXT I
80 CLS
90 PRINT CHR$(154);
100 OUT 178,64
110 F=0
  :E=0
  :C=1
120 BFS=""
130 KEY ON
140 ON KEY GOSUB 900,760,940,980,660,600,,890
150 KEY1,"ID"
  :KEY2,"QTH"
  :KEY3,"RIG"
160 KEY4,"LOG"
  :KEY5,"CQ"
170 KEY7," "
  :KEY8,"QUIT"
180 IF SP=0 THEN KEY 6,"20WM" ELSE IF SP=20
  THEN KEY 6,"15WM" ELSE KEY 6,"10WM"
184 '
185 'In-out calling sequence
190 GOSUB 220 'get key
200 GOSUB 320 'output cw
210 GOTO 190
  
```

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MORSE CODE

```
215 '
216 'Store & display key entries
220 KS=INKEY$
:IF LEN(KS)=0 THEN GOSUB 800
:RETURN
230 IF ASC(KS)=8 THEN GOSUB 700
:RETURN
240 IF ASC(KS)=27 THEN GOTO 80
250 IF KS="[" THEN LD$=""
:C%=1
:TS=DATES$+CHR$(32)+LEFT$(TIMES$,5)
:RETURN
260 IF ASC(KS)=13 THEN G=-1*G
270 K%=ASC(KS)
:IF K%<>32 AND (K%<44 OR K%>90) THEN 800
:RETURN
280 PRINT @E,K$;CHR$(154);
:E=E+1
:IF E=319 THEN E=E-40
:F=F-40
290 IFC%=1 THEN ID$=ID$+K$
:IF K$=" " THEN CZ=0
300 BFS=BFS+K$
310 RETURN
315 '
316 'Output cw to DTR port
320 IF BFS="" THEN RETURN
330 IF G=-1 THEN RETURN
340 OS=LEFT$(BFS,1)
350 PRINT @F,CHR$(255);
360 IF OS=" " THEN GOSUB 560
:GOTO 400
370 CWS=CS(ASC(OS)-43)
380 FOR J%=1 TO LEN(CWS)
:IF MIDS(CWS,J%,1)="-" THEN GOSUB 480
ELSE GOSUB 430
390 NEXT
:GOSUB 530
400 PRINT @F,OS;
:F=F+1
410 BFS=RIGHT$(BFS,LEN(BFS)-1)
420 RETURN
425 '
426 'Send dot
430 OUT 178,0
440 GOSUB 580
450 OUT 178,64
460 GOSUB 580
470 RETURN
475 '
476 'Send dash
480 OUT 178,0
490 FOR D%=1 TO 3
:GOSUB 580
:NEXT
500 OUT 178,64
510 GOSUB 580
520 RETURN
```

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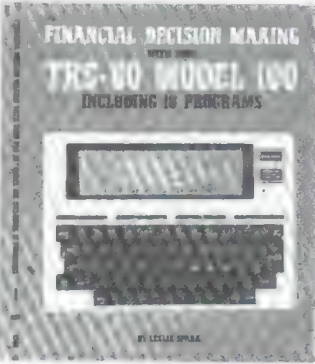
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59

## MORSE CODE

```

525 '
526 'Send char space
530 OUT 178,64
540 GOSUB 580
550 RETURN
555 '
556 'Send word space
560 OUT 178,64
570 FOR D%=1 TO 3
:GOSUB 580
:NEXT
:RETURN
575 '
576 'Delay
580 GOSUB 220
:FOR I%=1 TO SP
:NEXT
590 RETURN
595 '
596 'Change speed
600 IF SP=0 THEN SP=20
:KEY 6,"15WM"
:RETURN
610 IF SP=20 THEN SP=100
:KEY 6,"10WM"
:RETURN
620 IF SP=100 THEN SP=0
:KEY 6,"20WM"
:RETURN
655 '

```

```

656 'Send CQ
660 CQ$="CQ CQ CQ CQ CQ CQ CQ CQ DE K8TT K8TT
K8TT K "
670 BF$=BF$+CQ$
680 PRINT @E,CQ$;CHR$(154);
:E=E+LEN(CQ$)
:IF E>319 THEN S=(INT((E-320)/40)+1)*40
:E=E-S
:F=F-S
690 RETURN
695 '
696 'Delete a character
700 IF BF$="" THEN RETURN
710 PRINT @E,CHR$(32);CHR$(8);CHR$(8);CHR$(32);
CHR$(8);CHR$(154);
720 BF$=LEFT$(BF$,LEN(BF$)-1)
730 IF C%=1 THEN IDS=LEFT$(IDS,LEN(IDS)-1)
740 E=E-1
750 RETURN
755 '
756 'Send QTH
760 QS="TNX FOR CALL - QTH IS BOWLING GREEN, OHIO
? BOWLING GREEN, OHIO - NAME IS LOU ? LOU -
YOUR RST IS 599 ? 599"
770 BF$=BF$+QS
780 PRINT @E,QS;CHR$(154);
:E=E+LEN(QS)
:IF E>319 THEN S=(INT((E-320)/40)+1)*40
:E=E-S
:F=F-S

```

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## MORSE CODE

```

790 RETURN
795 '
796 'Balance timing
800 FOR I=1 TO 18
: NEXT
: RETURN
805 '
806 'Morse code
810 DATA ---..---..---..---..---..---..---..---..
820 DATA ---..---..---..---..---..---..---..---..
830 DATA ---..---..---..---..---..---..---..---..
840 DATA ---..---..---..---..---..---..---..---..
850 DATA ---..---..---..---..---..---..---..---..
860 DATA ---..---..---..---..---..---..---..---..
870 DATA ---..---..---..---..---..---..---..---..
880 DATA ---..---..---..---..---..---..---..---..
881 DATA ---..---..---..---..---..---..---..---..
885 '
886 'Quit
890 CALL 23164,0,23366
: CALL 27795
: MENU
895 '
896 'Send ID
900 $$=ID$+"DE K8TT."
910 BFS=BFS+$
920 PRINT @E,$$;CHR$(154);
: E=E+LEN($$)
: IF E>319 THEN S=(INT((E-320)/40)+1)*40

```

```

: E=E-S
: F=F-S
930 RETURN
935 '
936 'Send station information
940 RS=" RIG IS HEATH SB104A - 50 WATTS OUT TO
: BEAM ON 20 AND VEE ON 40 M - TRS-80 MODEL 100
: IS SENDING THE CW."
950 BFS=BFS+RS
960 PRINT @E,RS;CHR$(154);
: E=E+LEN(RS)
: IF E>319 THEN S=(INT((E-320)/40)+1)*40
: E=E-S
: F=F-S
970 RETURN
975 '
976 'Log the contact
980 OPEN "RAM:LOG.DO" FOR APPEND AS 1
990 PRINT #1,CHR$(62)+TS+CHR$(32)+ID$+CHR$(32)+
: DATE$+CHR$(32)+LEFT$(TIME$,5)
1000 CLS
: PRINT"Freq HRST MRST NAME QTH"
1010 LINE INPUT "":QS
1020 PRINT #1,QS
1030 CLOSE #1
1040 F=0
: E=0
: BFS=""
: CLS
: RETURN

```



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# Finding a Needle in a Haystack

*The endless search is over. This simple utility scans all files  
for one or more items — automatically.*

By Leo S. Reich

**H**ow many times have you been faced with the unenviable task of searching through several text files to find a certain word or name? Sure, it can be done using the F1 key, but what monotony! You have to go into the file, hit F1, type in the word or name, press Enter and, if not found, start all over again. And we all know that according to a certain Mr. Murphy and his Law, if you have 10 files, what you're looking for will surely be in the tenth file you search.

The following is a relatively simple and short utility program devised for the Tandy 200 (it can also be used on the Model 100 with a slight modification). Essentially, the program allows you to select and locate items of interest resident in one or more text files *without* using the F1 key.

## **BITS AND BYTES BACKGROUND**

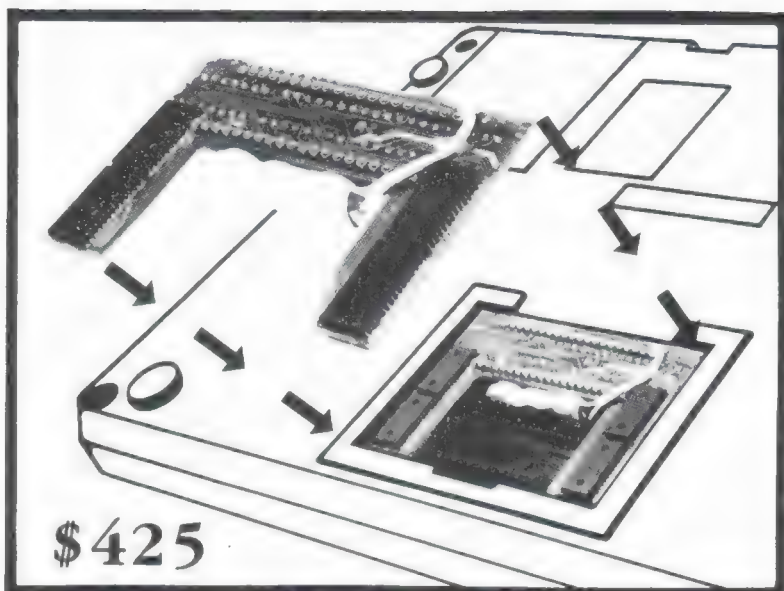
The program, called LSTFIL, uses the random access memory (RAM) directory of the Tandy 200. The first available user slot begins at location 62133 (\$F2B5) and ends at 62639 (\$F4AF). Each entry consists of 11 bytes.

The first byte contains type of file information. The individual bits (which make up the byte) are assigned as follows: bit 7 is 1 if the file is currently active and 0 (zero) if invalid (or inactive but residual); bit 6 is 1 if it's a .DO or text file; bit 5 is 1 if it's a machine-language file (.CO); bit 4 is 1 if the file is in read-only memory (ROM); bit 3 is 1 if an invisible file exists.

# Give your Model 100 128K

# RAM

Installs as easily  
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Software included, transfers from bank to bank. Works like main menu! Includes powerful RAM Basic that lets any program regard the 128K as one continuous bank.

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As amazing as it seems you can upgrade your Model 100 to 128K of RAM in just 60 seconds.

It comes to you right out of the box looking just like the picture. You just open the little compartment on the back of your Model 100 with a quarter and it just pushes right into place. You can then put the cover back in its place.

You then have 4 banks of RAM of 32K each. The additional three banks also work just like your Main Menu.

You push a function key and you are in the second bank. Push again and you are in third, again, then fourth. Press it once again for your original bank.

It has its own built-in NiCad battery that recharges right from the Model 100 and its guaranteed for a full year.

What is really great is that you can copy a file from one bank to another with just a function key.

Each bank is like having another Model 100, and all the built-in programs as well as any snap-in ROM programs appear in all four banks and work the same way. Your widebar cursor moves from file to file and you access any file or run any program just by pressing ENTER.

What lets you copy any file from one bank to another is a snap-in ROM from PCSG called RAM+, that comes at no extra charge. It just pushes right into the little socket in that same compartment with the 96K expansion unit.

Not only does this firmware let you copy a file from bank to bank, but you can make a copy of any file within the same bank instantly with a function key. Great for Lucid spreadsheets!

### Copy a file from bank to bank with a function key

You can also rename a file, or kill any file with just a function key. Plus you can do a whole lot of other useful things like setting the date, day and time with function key ease. You even have a function key that lets you use non-Radio Shack printers without having to make those tricky dipswitch settings.

RAM+ lets you cold start any one of your banks without affecting the other three. That means that anytime you want you can clean out a bank's entire memory, but leave intact all the files in the other banks.

What is also fantastic is that you don't have to have the ROM in place to use the additional RAM. Whenever you take out the snap-in ROM it leaves behind a tiny machine code program that lets you switch from bank to bank just by pressing ENTER.

This lets you use your ROM socket to snap-in other ROMs like LUCID spreadsheet, WRITE ROM text processor, or DISK+ ROM file transfer program, and use them in any or all four banks. All of these, by the way, are available from PCSG.

When you are ready to copy a file from one bank to another or use any of the other fantastic functions we talked about you can just snap the RAM+ ROM back into place.

Everybody that has this 128K system in their Model 100 is so excited, because it gives them four times the capacity and all banks work just like the Main Menu.

And what has made a lot of people happy is that the system bus, located in the same compartment, is left free for you to plug in a DVI or the Holmes Engineering/PCSG portable disk drive.

The ability to copy a file from bank to bank instantly with a function key, plus all of the other features make this RAM extension truly an engineering masterpiece.

Some people hesitate when they think of installing something, and then others are skeptical that any additional hardware could be as good as the Model 100 itself. That's why we sell these 96K expansions on a 30 day trial. Simply return it within 30 days for a full refund if you are not satisfied. Priced at \$425. MC VISA COD.

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## A New Classified Ad Section to Serve 100/200 Users

Thus, an active text (or ASCII) file has a first byte value of 192 (\$CO). The second and third bytes contain the starting address of the file itself (least significant byte first) and the next eight bytes the file name.

Of those eight bytes, the first six allow for a file name up to six characters (spaces replace characters if less than six characters are used). The remaining two bytes are reserved for the file extension (the period is omitted).

LSTFIL uses this information to locate and identify files to be scanned. This process is continued for succeeding files.

### SEEK AND YE SHALL FIND

When the program is run, you'll be asked to enter the number of items you're searching for. If you are looking for just one, you'll be prompted to enter it. If you're looking for more, you will continue to be prompted until all have been entered. Hitting Enter following the last entry begins the search.

The program displays the 11 bytes associated with each file plus the name and starting address for valid ASCII files. If the file has an extension other than .DO (or is an inactive or "killed" text file still residing in memory), it's not scanned and the program continues to the next file.

When an active ASCII file is encountered, it's scanned rapidly. If an item being searched is found, a line appears in reverse video indicating what was found and where (file name) and is then followed by a "Break" statement.

At this point, you can either abort the program or continue by typing "cont". Each time an item is found, the program pauses and alerts you.

File scanning continues until the first empty user slot is encountered. When this happens, the screen clears and the message "SEARCH OVER!" appears in reverse video.

### SPEAKING FROM EXPERIENCE

You should be careful when selecting only a partial word or name since all words and strings containing it will cause needless program breaks. This is not only aggravating but time consuming.

In a test run which involved six text files (totaling 4200 bytes, three programs and five inactive files (resident in memory), the duration of the run until the first empty slot was about 40 seconds. Of course, this was searching for one item — more items will take longer to run.

# STILL HUNGRY?



## LISTINGS, HERE!

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Bon Appétit

The program is flexible and can be easily modified even by those who only have a fundamental knowledge of BASIC.

## NUTS AND BOLTS

As previously mentioned, LSTFIL, which requires about 1200 bytes of memory, can be modified for the Model 100. Line 170 of the program indicates the starting address (62132) of the first user slot of the directory. For a Model 100, change the starting address to 63841.

In line 210, the first three bytes are

skipped and only the last eight are considered for scanning purposes. When these contain a .DO extension and the first byte is not zero, the name and starting address of the file are listed. The scanning routine then starts on line 330. However, if the file name does not include the .DO extension or contain a first byte equal to zero, then only the name is displayed and the next file is scanned (line 270).

For a valid ASCII file name, the name is altered to include the normal extension (line 330). Then the valid file is opened and its contents scanned.

Lines 350 to 410 provide for hard copy if needed.

Lastly, when a "needle" is found, a message is displayed in reverse video followed by a break. If you've found what you wanted, you can either continue by typing "cont" or stop it by hitting F8. If you continue, the program searches until it finds the first empty user slot and prints "SEARCH OVER!" (line 270). □

Please help us rate this article's value. If you've found it very valuable, circle 170 on the Reader Service Card. If it was moderately valuable, circle 171—and if it wasn't valuable to you, circle 172.

```
10 LSTFIL
20 'L.S. REICH'
30
40 'FOR ITEM(S) SELECTED, NAME TEXT FILE(S)
50 'FOR ITEM(S) & DISPLAY WHERE LOCATED IN FILE(S)
60
70 CLS
80 CLEAR 2000
90 PRINT @120, " ";
:INPUT "Enter no. items to be searched: ";NI
:PRINT
100
110 FOR JJ=1 TO NI
:PRINT "Enter item #";JJ;
```

```
:INPUT ITS(JJ)
:PRINT
:NEXT JJ
:CLS
120
130 AA$=""
:BB=1
140
150 FOR J=BB TO 2000
:REM MORE THAN NEEDED TO LOCATE 46 USER .DO FILES
160
170 LL=62132+J
:AA=PEEK(LL)
:REM START OF USER SLOT #1
180
```

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Circle 55 on Reader Service Card

```

190 PRINT AA;" / ";
200 '
210 CC=CC+1
:IF AA>64 AND AA<91 AND CC>3 THEN GOTO 230
ELSE GOTO 270
:REM ONLY LAST 8 BYTES OF FILE ENTRY
220 '
230 AAS=AAS+CHR$(AA)
240 '
250 IF INSTR(AAS,"DQ")>0 AND PEEK(LL-10)>0
THEN PRINT AAS
:PRINT
:PRINT "Starting Addr. = ";
:ST=256*PEEK(LL-8)+PEEK(LL-9)
:PRINT ST
:CC=0
:PRINT
:GOTO 330
260 '
270 IF J/I1=INT(J/I1) THEN PRINT AAS;
:IF AAS>" " THEN AAS=" "
:CC=0
:ELSE CLS
:PRINT @133," "
:PRINT CHR$(27);"p";" Search over!"
:PRINT CHR$(27);"p";" Search over!"
:BEEP
:PRINT CHR$(27);"q";
:END
280 '
290 NEXT J
300 '
310 END
320 '
330 AAS=MID$(AAS,1,LEN(AAS)-2)+".DO"
340 '
350 OPEN AAS FOR INPUT AS:1
360 '
370 LINE INPUT #1,TTS
390 '
410 PRINT TTS
420 '
430 FOR D=1 TO NI
440 '
450 IF INSTR(TTS,ITS(D))>0 THEN PRINT
:PRINT CHR$(27);"p";" Item desired, ";
CHR$(34);ITS(D);CHR$(34);", is in ";AAS
:BEEP
:PRINT CHR$(27);"q";
:STOP
:GOTO 470
460 '
470 NEXT D
475 '
480 IF EOF(1) THEN 510
485 '
490 GOTO 370
500 '
510 CLOSE
515 '
520 CLS
530 BB=J+1
540 AAS=""
550 GOTO 150

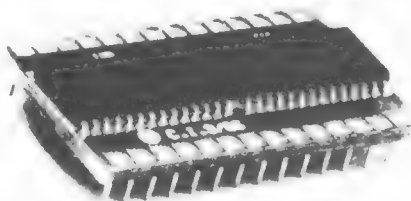
```

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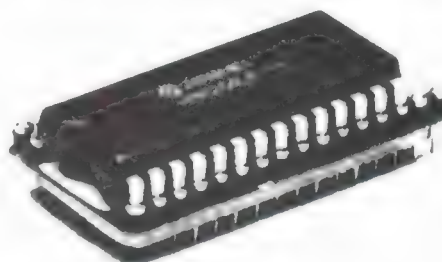


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**GIGO** (from page 43)

## DATEBOOK UPDATED

The article "Datebook for the Disorganized" by Ray Mendenhall in your July issue is an excellent program. However, I found it to be more useful by changing the following lines:

```
760 INPUT CD$
970 CLOSE:FOR X=1 TO 500:NEXT
    X:GOTO 200
1010 CLOSE:GOTO 200
```

Then add these new lines:

```
805 IF LEN(CD$)>5 THEN IF CD$
    <> LEFT$(A$,LEN(CD$)) GOTO
    910 ELSE 850
806 IF LEN(CD$)=5 THEN
    CD$=CD$+RIGHT$(DATE$,3):
    IF CD$ <> LEFT$(A$,8) GOTO
    910 ELSE 850
```

The change in line 760 and the addition of lines 805 and 806 allow a search for any date other than the current month.

When F5 is typed, a date prompt is printed in reverse video at the bottom right side of the screen. If the date is in the current month, it is necessary to enter only a two digit day. If the date is in the current year, it's necessary to enter both the month and day as MM/DD. However, if the date requested is in another year, you must enter the full date form MM/DD/YY.

The changes in lines 970 and 1010 return the program to the current month and day after any search. As written, the original program returned to the current month but to the date used in the previous search.

Robert J. Hennessey  
Needham, MA

## JUMP, JUMP, JUMP

Here's a complaint about the current format of your magazine. It's a chore to read it each month because most of the multi-page articles are split up and I'm constantly jumping back and forth just to read articles in sequence. Please consider changing this in future issues so your readers don't have to work to get all the useful information you provide each month.

Edward Reddy  
72446,360

Unfortunately due to size, shape and color requirements of our advertisements we are forced to jump stories to the back of the magazine. It's not something we like to do, just something we all have to live with. —Ed. □

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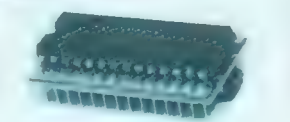
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57	61	Compu-Charger
3	10	CompuServe
58	9	Coriolis
58	12	Covington Group
52	56	Covington Group
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50	62	Data Transfer
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60	30	Dresselhaus
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51	64	MCI Mail
—	64	Marketplace
49	27	Merritt
25	26	Micro Demon
CIII	28	Micro Peripheral
42	29	Nictrix
46	31	Node
33	41	P.C.S.G.
15	34	P.C.S.G.
39	32	P.C.S.G.
21	36	P.C.S.G.
26	35	P.C.S.G.
45	37	P.C.S.G.
63	33	P.C.S.G.
69	38	PG Design
CII	39	PG Design
53	40	PIC
40	44	Polar
42	53	Pomerleau
22	42	Portable Basics
65	—	Portable Program Review
29	17	Prairie Power
10	45	Purple Computing
57	46	Purple Computing
16	49	Purple Computing
68	43	Queue Software Systems
37	47	Radio Shack
4	51	Sigae
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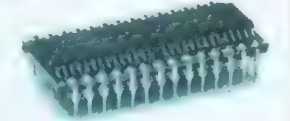
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# Tandy's ROM

By Carl Oppedahl

**I**nteractive Solutions is a nice ROM-based package, with medium-powered database, spreadsheet and text-formatting capability. The three programs are well integrated — selected material from a data file may be loaded into a spreadsheet or document, and spreadsheet results can be pasted into a document. The text processor can perform a mail-merge based on information in a data file, as well. Because Interactive Solutions (IS) is in ROM, most of RAM (up to about 27K in a 32K machine) is available for data records, spreadsheets and documents.

## WHAT YOU GET

IS comes in the same standard small padded brown binder as other Tandy portable software. Enclosed are a

ROM chip, an 82-page manual, 16-page quick reference booklet and two errata sheets. The binder has a flimsy plastic compartment for the ROM chip when not in use; mine was deformed in shipment so that it would no longer hold the chip right. If you leave IS installed all the time this is obviously not a problem.

## INSTALLATION

The IS instructions tell you how to insert the ROM into the option ROM socket. If you have another ROM in there from before, you will have to follow the appropriate procedure to deinitialize the previous ROM before removing it. Then you type in a one-line BASIC program, which when executed from the main menu (see sidebar) gets you into the option ROM menu.

IS provides three programs — a data manager, spreadsheet and text formatter. Progress between and among the programs is via a number of submenus; in most cases F8 will get you to the next higher menu, and pressing it a few more times gets you back to the familiar Model 100 main menu.

## THE DATA MANAGER

The data manager is pretty neat. You can set up one or more data files, each with its own record layout. Each data file consumes two menu filenames (both .DO files), one for the data itself and one for the layout. These files may be sorted according to any field, and records can be extracted according to conditions on any or all of the fields. The extracted records may be printed, displayed on the screen, or pasted into a text file. As discussed below, the extracted records may be pulled into printed correspondence in full mail-merge fashion.

The limit on database size is twofold; each database takes up two menu slots and the databases taken together with any other RAM files cannot exceed the RAM memory capacity of the computer. RAM files not currently in use may be stored on cassette or on 3.5 inch floppy disk, but not on the DVI.

No provision is made for entering records into a data base except by manual typing, though a patient hobbyist could find ways to massage a previously existing data file into the layout expected by IS. Fortunately IS *does* allow its output to go to a file.

Last month I reviewed Ultimate ROM

from Traveling Software; like IS, it is an option ROM containing three programs. Because two of the Ultimate ROM programs (T-base and T-Writer) overlap two of IS, it makes sense to compare them. (The programs that do not overlap are IS's Data Calc and Ultimate ROM's Idea, an outline or idea processor.)

The IS Data Manager operates on only one data file at a time; there is no relational capability. By way of comparison, Ultimate ROM allows relational retrieval of information from two or more data files. T-Base has more report generation flexibility built in, but either program lets you paste data reports into documents, giving you the ability to edit and rearrange reports as needed. Both let you sort records on a selected field.

## DATA CALC

The spreadsheet program in IS is called Data Calc, and it's only a little better than Radio Shack's Spectaculator. You can't give each cell a different formula, but rather must assign formulas for each row or column. The sheet can be as large as 99 rows or 99 columns.

Data Calc is not very well error-trapped. It tends to lock up the keyboard

if you accidentally give Data Calc the filename for a .CO file other than one created by Data Calc. According to the manual it can destroy your files if turned off during recalculation. So be sure to put in fresh batteries before using it. Remember that when the batteries get too low the Model 100 turns itself off automatically.

You can load information from Data Manager into Data Calc with just the touch of a few keys; that's nice and no other Model 100 software I know of does this. It lets you paste all or part of a spreadsheet into a document, a standard spreadsheet feature. Data Calc does not, however, read from or write to DIF (data interchange format) files, limiting your ability to pass information between Data Calc and other spreadsheet programs.

## THE WORD PROCESSOR

IS provides a nice text processor, augmenting and interacting with the built-in program TEXT. It allows detailed print formatting with spacing over perforations, indentations, headers, footers and nearly every feature you'd expect in a formatter.

IS creates a file containing formatting parameters (xxxCTL.CO where xxx is the beginning of the document file name) for each file edited. You can easily use up menu slots that way. The numerous CTL.CO files are not discussed in the manual at all, except in an incorrect reference on the last page to a single file PRCCTL.CO.

IS also creates a small file called

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## ROM ON HIGH

Ah, for the good old Model 100 days, when virtually everything was in BASIC and only experimenters used machine language. Mine was a voice in the wilderness when I predicted that machine language conflicts would crop up often in the Model 100.

Nowadays, lots of commercial programs are in machine language and the remainder are a hybrid of BASIC and machine language. Like hotdog vendors near a busy corner, they almost invariably compete for that convenient location just below MAXRAM (62960).

Interactive Solutions (IS), despite its claim in the Radio Shack catalog that it doesn't occupy RAM, nonetheless requires 2.7K of RAM between 60200 and 62960. Prior to using IS, any other machine language program located above 60200 must be saved elsewhere (presumably as a cassette or RAM.CO file).

This means, among other things, that you cannot use IS with the Disk/Video Interface, nor with any other machine-language program requiring that area.

If you have some machine language program in place that uses RAM hooks (barcode reader, printer driver, Thinview, ProAid, etc.) it is particularly important to reset the RAM hooks before using IS. Otherwise you'll likely lose all your files in the dreaded return to January 1, 1900.

Machine language programs also have a distressing tendency to contain bugs which, when triggered by an unanticipated input, will lock up the machine (requiring hardware reset) or destroy all your files. In two days' experimentation, I uncovered one bug in IS that caused a lock up.

Regrettably, none of this — not one bit of it — is discussed in the IS manual. It

would be bad enough if the manual simply failed to disclose the risks associated with machine language, but matters are worse — the manual does not even reveal that machine language is used. Indeed the manual implies the opposite when it says IS "does not occupy RAM."

The only clue that machine language is used is in the installation process — a command CLEAR 0,60200 is used. A new user may attach no particular significance to this, but a sophisticated user will know that it's time to worry about all the other machine language programs in use.

Tandy assures me that the machine language driver for the 3.5 inch micro floppy drive is designed so that it can be moved to a lower area in RAM, and can thus be used with IS.

— Carl Oppedahl

## OPTION ROMS THROUGH THE YEARS

By now we have seen four physically different option ROM styles. The first on the market was Polar Engineering's Option ROM, using a commonly available 8K PROM. Because the pin assignments of Polar's PROM disagreed with Tandy's pin assignments in the Model 100 option ROM socket, Polar had to wrap the integrated circuit (IC) with a thin, flexible printed wiring board that rearranged the pin connections. This package, a rather fragile affair, had to be guided into place with a couple of coins for spacing.

Next on the scene was PCSG's Lucid, an 8K EPROM on a sturdy glass epoxy board, with cutouts and spacers built in for correct spacing and orientation in the socket. The epoxy board rearranges the pin connections to match the Model 100. That technology is used for Disk Plus, Write-ROM and other option ROMs. Some users have reported that

the PCSG carrier board has bent one or more contacts in the option ROM socket during removal. It's important to use the ribbon provided and pull the ROM up perfectly straight.

A recent refinement was Polar's use of a Molex carrier for the IC of Traveling Software's Ultimate ROM. The carrier is specifically designed to match the option ROM socket in the Model 100. Again, pin rearrangement is required and a flexible thin printed wiring board is used.

Finally, with IS, we see for the first time a ROM rather than the PROM or EPROM used before. And not only is it a ROM but its pin assignments match those of the Model 100. It fits right into a Molex carrier and into the option ROM socket.

The manner in which the user gains access to the option ROM has also varied from one ROM to the next. Lucid and

Ultimate ROM provide main menu filenames which, when selected, make the jump into option ROM. You're aware that you can enter a .DO file from the main menu and this will get you into TEXT. Lucid, a spreadsheet program, follows this convenient style and lets you enter a spreadsheet file from the main menu, thus getting into Lucid with fewer keystrokes.

Polar's Option ROM and IS are simply accessed by a CALL 63012 command; in either case you can set up a one-line BASIC program containing the CALL which may then be used to select option ROM from the main menu. It is too bad IS does not allow entry into a particular database file or spreadsheet through menu selection. Instead you must get to, say, Datalc, through selection on two menus, then you must type in the filename manually to the Datalc prompt.

— Carl Oppedahl

PRT.DO which lets you customize control codes (i.e. underscore or italic) specific to your printer. The discussion in the manual neglects to mention that the control codes must be typed in hexadecimal notation.

IS can provide a justified right margin, but the justification is accomplished by inserting whole spaces between words and it looks choppy.

Dot commands take care of the usual margin changes and page skips when inserted in .DO files. Provision is made for loading information from the spreadsheet or data-file part of memory into RAM .DO files.

Both the Ultimate ROM program T-Writer and the IS formatter have mail-merge capability. T-Writer takes information from the file ADRS.DO and IS gets it from the data file of your choice. The other formatting capabilities and features are largely comparable.

## DOCUMENTATION

Why does anyone send a \$150 piece of software to market without an index in the manual? Many topics are discussed two or three times in the book, so that when you leaf through it to answer a question you cannot be sure you have the complete answer. If there were an index you could go to the three places directly.

The 82-page manual does a good job of explaining the programs by example, but it is poor at spelling out general

rules for use of the various functions. For example, in the data manager you may wish to select records for printing based on one or more criteria, and you do this by typing in relational operators and values regarding each field. Some operators have obvious meaning — an equals sign will select only records for which the field is equal to the specified value, and a less-than sign will select records for which the field has a smaller value than that specified.

But one operator, the pound sign (#), is described as a "partial match." The new user eagerly reads on hoping to learn just what is meant by a partial match. Further on the manual states that, "A partial match means that a record with some similarity to the condition specified is selected." Not knowing exactly what is meant by "some similarity," we read on.

Eleven pages later, the pound sign comes up again. We learn, "the pound sign means that the string you type for a particular field has to be at least a partial match to that which has been typed in the record field before a record can be retrieved."

By trial and error I learned what the pound sign really does — it's a search using the logic of the familiar BASIC function INSTR. If the search string appears anywhere in the field of the record being tested, then that record is considered a partial match. A search entry of "#keeper," for example, will retrieve a

record containing "bookkeepers." But you could never have determined that from the manual.

The manual lamentably gives no explanation of how high memory (above HIMEM) is used, so you must read between the lines instead.

This program is supported by Language Group II. I found the people there were familiar with it and were able to answer most of my questions. In an industry with widely varying levels of customer support, this makes Tandy look pretty good.

## THE ROM ADVANTAGE

Copy protection is not really an issue with ROM-based software like Ultimate ROM or IS. The software is on a medium that is not easily copied so the publisher can be sure of getting his royalty for each copy in use. It's safe against the risks associated with magnetic media, so you never really miss the ability to make backups. Perhaps the nicest aspect of ROM-based software is that the publisher can let you use the software for a while to see if it suits your needs, and you can return it if it doesn't. PCSG and Traveling Software both offer 30-day free trials of ROM software, and I suspect many Radio Shack stores would also accommodate such a request.

If you can get through the manual, you can probably use IS. It is convenient and useful, saves RAM and gives you a good text formatter and data base. □



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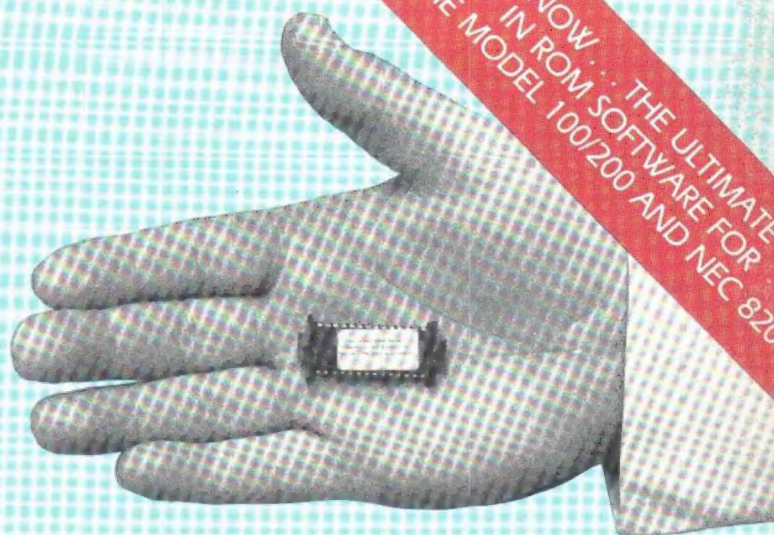
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